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WORKING PLAN

FOR

THE BOLAMPATTI RANGE

OF

COIMBATORE CENTRAL FOREST DIVISION

(From 1st April 1962 to 31st March 1972)

By

Sri J. WILSON

Madras Forest Service

Under the directions of the Chief Conservator of Forests, Madras

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PREFACE

The working plan prepared by C. J. Van Hæften (1st January 1944 to 31st December 1958) for the whole of the then Palghat Forest Division was the last working plan to deal with the forests of Bolampatti Range. The revision of the working plan was not undertaken in time, as the major portion of the old Palghat Forest Division was transferred to the new Kerala State on 'States Reorganisation'. The prescriptions of Van Haeften's Plan therefore continued to be in force, but most of them were superseded even from 1954, by numerous amendments or in the course of implementing the development schemes under the Second Five-Year Plan (1956–61).

The Bolampatti Working Plan Division was formed on 12th April 1960. The works connected with the plan were completed by 31st March 1961. A staff of 1 Ranger, 2 Foresters and 1 Lower Division Clerk generally formed the composition of the team to assist the writer both in the field and in office work.

Bearing in mind the acknowledged policy of the Government to introduce the metric system, metric equivalents have been given in brackets of all measurements quoted in this plan. This, the writer hopes will help the territorial staff to get used to the new system when it comes into force.

The author of this plan places on record his indebtedness and thanks to Sri T. Jeyadev, acting Chief Conservator of Forests, for his valued guidance, and Sri K. A. Bhoja Shetty, Principal, Southern Forest Rangers College, Coimbatore, for the unstinted help given by him in providing the writer with the technical facilities available in the College whenever requested.

COIMBATORE,
31*st March* 1961.

J. WIL SON,
Working Plans Officer,

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WORKING PLAN FOR THE BOLAMPATTI RANGE OF COIMBATORE CENTRAL FOREST DIVISION.

PART I

Summary of facts on which the proposals are based.

CHAPTER I—THE TRACT DEALT WITH.

SECTION 1—NAME AND SITUATION.

1. This working plan deals with the reserve forests of the Bolampatti Range of Coimbatore Central Forest Division. For the sale of *Avaram* bark only, the unreserves of the Bolampatti Valley also are taken into account.

2. The range is situated between 10° 47′ 40″ and 11° 3′ 5″ North Latitude, and 76° 39′ 26″ and 77° 4′ 0″ Longitude, east of Greenwich in the Coimbatore taluk of Coimbatore Revenue district.

SECTION 2—CONFIGURATION OF THE GROUND.

3. For purposes of easy description, the area can be divided into two regions—(*a*) The Walayar Valley and (*b*) The Bolampatti Valley.

(*a*) *The Walayar Valley.*—The Walayar Valley lies in the Palghat Gap and is south of the Bolampatti Valley. Only a portion of the valley lying east of the Walayar river and falling within the Coimbatore Revenue District forms part of the range, the rest of it falling in the Kerala State. The Bolampatti hills run from west to east diminishing gradually in height from about 5,000 feet (1,524 metres) at the western end, until they merge with the plains at Madukarai. The forests occupy the southern slopes of the hills and extend downwards into the plains at an average elevation of about 1,000 feet (305 metres). The main drainage system is the Walayar river which flows towards the west.

(*b*) *The Bolampatti Valley.*—The Bolampatti Valley lies north of the Walayar Valley and is shaped like a horse shoe opening eastwards. In the lower portions of the valley, the ground slopes gently to the east and here the elevation ranges from 1,503 feet (458 metres) on the Noyilar (the lowest point in the area) to 1,750 feet (533 metres). Above the 1,750 feet (533 metres) contour the ground rises sharply to the crest of the hill ranges to the north, west and south, the maximum elevations attained being 6.500 feet (1,986 metres) on Periyakunjiramalai at the south-west corner, and 5,907 feet (1,800 metres) on Vellingiri Peak at the north-west, and 5,000 feet (1,523 metres) on Varadamudi northwards. The hills forming the sides of the horse shoe fall gradually as they run eastwards until they merge with the plains near Coimbatore at an elevation of about 1,500 feet (457 metres).

4. The valley drains eastwards into the Noyilar, ' a stream of some importance locally, which, flowing eastwards between Coimbatore and Podanur, joins the Cauvery between Erode and Karur '. The Noyil is an important source of irrigation and the forests on its catchment area therefore require careful protection.

SECTION 3—GEOLOGY, ROCK AND SOIL.

5. *Geology.*—All the rocks, excepting the alluvia and a few sub-aerial formations belong to the great gneissic series. As a rule, fine grained hornblende varieties of gneiss predominate, but bands of massive or granitoid varictics also occur, as in the hills north of the Palghat Gap. Quartz, hornblende, felspar and garnet are the chief constitutents of the rocks. Mica is occasionally seen, as in the rocks at the top of the Kilikanuvai.

6. Crystalline limestone beds occurring amidst the gneisses in the hills to the east of the Walayar river are a prominent feature. Massive blocks or boulders may be observed

at the foot of the hills, and the fields between the Walayar river and Madukarai, exhibiting a stratified structure and are probably the result of the acqueous removal of the lime on the hornblende, which replaces mica in the Coimbatore gneiss. The foliated nature is very conspicuously perceptible even at a distance. Limestone also occurs in a non-crystalline nodular form known as 'Kankar', a variety fairly common in the Sholakarai Block and at the eastern ends of the Bolampatti Valley.

7. The Associated Cement Company has its works at Madukarai and manufactures good Portland Cement from crystalline limestone obtained from quarries at Madukarai and Thenkaradu.

8. There are a few small quarries at Marudamalai, Dhaliyur and Attukal supplying an inferior quality of granite. A fair proportion of the building stone requirements of Coimbatore town and a few for the surrounding villages are met from these quarries. Calcareous tufa may be seen in the streams between Thenkaradu and Ayyaswamimalai.

9. *Soil.*—In the whole of the Walayar Valley and in the eastern portion of the Bolampatti Valley, black cotton soil of no great depth overlies a layer of kankar. Sometimes patches of red clayey scil are seen owing to the presence of iron as in the Ayyaswami South Block. In the Bolampatti Valley, the admixture of sand in the soil improves on proceeding westwards.

Section 4—Climate and Rainfall.

10. *Climate.*—The climate varies considerably in different parts of these forests. The western portions are damper and cooler and the climate progressively becomes drier and warmer as one proceeds eastwards.

11. *Rainfall.*—The average rainfall varies, with the locality being moister towards the west. The southern range of hills are in general moister than the northern, as they catch considerably more rain from the south-west monsoon. It is 200 centimetres at Adivaram, 120 centimetres at Sholakarai, 75 centimetres at Iruttupallam and 50 centimetres at Coimbatore. Both the monsoons are felt, but much of the precipitation is from the north-east monsoon.

12. A tabular statement showing the average monthly and average annual rainfall in centimetres at the various recording stations in the range is given in Appendix I.

13. *Winds.*—The Walayar Valley is swept by strong winds during both the monsoons, as well as in the months of January and February. The Bolampatti Valley gets more winds than rain during the south-west monsoon.

14. Both the Bolampatti and Walayar Valleys are hot and dry from March to May. The climate is cool from June to September because of the cool winds from the west and occasional drizzles of rain. The claimate continues to be cool but pleasant because of the absence of strong winds during the rest of the year, when the north-east monsoon brings in most of the annual rainfall.

15. *Health.*—Both Walayar and Bolampatti valleys were said to be highly malarious at one time. Introduction of large scale anti-malarial operations like frequent spraying of insecticides and clearing of jungle around habitations has brought down the incidence of the disease to a level far below what it was before. Apart from malaria, both the valleys are comparatively healthy.

Section 5—Water-supply.

16. *The Walayar Valley.*—There are two perennial streams, (1) The Walayar river which has part of its catchment area in the Kerala State, and (2) the Thannitorapalamthodu, east of Thenkaradu hill.

17. *The Bolampatti Valley.*—The Noyilar and its tributaries like the Murdanthoraiar, the Chinnar, the Periyar, the Aneyar, the Kallar, the Kanavaraiar and the Waimukkaiar are perennial. Besides these important perennial streams, there are a few smaller ones in the following places which also do not run dry in the hot season :—

(1) The Neeliamman spring in the Kilikanuvai valley from which a pipe-line supplies water to Mathipalayam village.

(2) The Kalimangalam well in Kinathukadu, from which a pipe-line supplies water to the village of that name.

(3) The Pachanapathi uthu west of Rangaswamy Koil.

(4) Nandanagiripallam with irrigation channels running down from the hills above the Kalkothipathy valley.

(5) The Varampoo spring.

(6) The spring at Poondi.

(7) The Thayathorai spring from which a pipe-line supplies water to Dhaliyur village.

(8) Puthukannu Thirtham, Marudamalai.

(9) There is also a perennial water hole near the foot of the hills, a little to the east of the Kuthadimalai Valley.

18. The well in the Iruttupallam Range Colony is too close to the Noyilar which often carries stagnant water and has a reputation of being unhealthy and germ-laden.

SECTION 6—DISTRIBUTION AND AREA.

19. The total extent of forests of the range is 76.32 square miles (197.66 square kilometres). A complete list of all the forest blocks in the range, their extent and legal position is given in Appendix II.

SECTION 7—STATE OF BOUNDARIES.

20. The boundaries of the reserves are partly natural and partly artificial.

21. *Natural boundaries.*—The Walayar river forms a natural boundary delimiting the forests of the range in the Walayar Valley, with the Kerala State on the west. The other natural boundary is the water-shed line along the crest of the hills of Bolampatti Blocks I and II separating them from the Vadasseri private forests in the south, the Kerala State forests forming the Attapady Block VI in the west and the Mannarghat Moopil Nair's private forests towards north-west, and the Perianaickenpalayam Range towards the north.

22. *Artificial boundaries.*—The artificial boundaries are usually cleared lines with cairns and numbered stone pillars. On the eastern boundary of the Sholakarai Block a system of trench and mound also exists, but the field survey stones which ought to be found near the cairns in this locality are not traceable in many cases.

23. The stone cairns have been knocked down by elephants in places frequented by them. The artificial boundaries are otherwise maintained satisfactorily, but the numbering of the cairns is mostly faulty or the numbers have been obliterated.

24. *Discrepancies.*—Some discrepancies were noticed by the writer between the boundary as it exists on the ground and as is represented in the Survey of India maps in the case of the Ayyaswami South Block.

25. Several discrepancies including minor encroachments along the outer boundaries of the Ettimadai ex-panchayat forests have been noted mostly around Madukarai. The

existing boundaries do not agree with the Section 16 notification in many places. Obviously, these discrepancies have arisen when the areas were under the management of the panchayat.

26. *Internal boundaries.*—The boundaries of the Irular and Muduvar settlements inside the forests are in practically all cases not defined except for the rough plan shown on the maps. Encroachments are likely as the areas shown on the map do not tally in the field.

27. The same is the case of the several temples and shrines within the reserve limits. As the Forest Settlement Officer has not accurately defined the limits within which the rights admittted may be exercised, it was suggested by Venkateswara Ayyar (1937–44) that such areas should be more precisely defined. This work does not seem to have been done yet. There are reasons to presume that the 'surrounds' of some of these temples have been enlarged without proper sanction, after the original settlement.

28. It seems desirable to define all such areas more precisely.

Section 8—Legal Position.

29. The forests dealt with herein have been notified as reserve forests under Section 16 of the Madras Forest Act. The details of notification, etc., are given in Appendix II.

Section 9—Rights and Concessions.

30. *Rights.*—All the reserves are the absolute property of the Government and none is encumbered with any rights of importance. A list of all rights admitted are given in detail in Appendix III of this plan.

31. *Concessions.*—At the time of forest settlement, the jungle tribes residing in the forests like the Irulars and the Muduvars were allowed to continue their cultivation in lands set apart for them under annual leases. The terms of this lease are detailed in Chapter IV. The following is a list of all the settlements :—

(a) *Walayar Valley.*—(1) Parapatti East; (2) Parapatti West. Both of these settlements have since been abandoned and the Irulars have migrated into the adjacent Vadasseri private forests in Kerala State.

(b) *Bolampatti Valley.*—(1) Singapathy, (2) Jagirporathy East, (3) Jagirporathy west, (4) Sarkarporathy, (5) Kalkothipathy, (6) Vellapathy, (7) Sadivayal South, (8) Sadivayal North, (9) Boddapathy, (10) Melapathy or Attukalpathy (Attukal Pallam), (11) Pungancherry, (12) Savakad, and (13) Marudamalaipathy.

32. The settlements at Pungancherry and Savakad have been abandoned by the Irulars who have apparently migrated to the adjacent settlements.

CHAPTER II—THE FOREST.

Section 1—Composition and condition of the crop.

33. The forests of the range may be considered to fall under the following main types :—

(a) The southern Cutch thorn forests—Champion's type 5 a/C1.3

(b) The mixed deciduous forests. 3 b C2

(c) The Western 'tropical' evergreen forests—Champion's type 1 a/C3.

(d) The Nilgiri sub-tropical evergreen forests—Champion's type 8a/C1.

34. The line of distinction between two types is sometimes not clear, one type tending so merge almost imperceptibily into another.

(a) 5a/C1 *The Southern Cutch thorn forests.*

35. This type of forest is seen at the eastern ends of the range where conditions are extremely dry and the annual rainfall barely 75 centimetres a year. The forest here consists of a deciduous scrub with an overwood of predominantly thorny species like *Parambai* (*Acacia ferruginea*), *Unjal* (*Albizzia amara*), *Porasu* (*Chloroxylon swietenia*), *Palai* (*Wrightia tinctoria*), *Malankiluvai* (*Protium caudatum*), *Anaimullu* (*Acacia latronum*), *Zizphus* species, etc. In areas with better soil as the Ayyaswami South Block, often pure patches of *Porasu* (*Chloroxylon swietenia*) are seen to occur. In areas with very shallow soil interspersed with rocky outcrops the overwood is mostly of *Malankiluvai* (*Protium caudatum*) as seen in the Ettimadai Ex-panchayat forests and in large areas in the Ayyaswami North, Konamalai, Ichikuli and Marudamalai Blocks. Evidently this species is the only one left over of an otherwise mixed forest due to indescriminate cutting in the past. The trees usually have short boles with low branching crowns. The usual height is 25 to 30 feet (8 to 10 metres). The forest deteriorates progressively into a thorny scrub as one proceeds eastwards and one encounters almost bare slopes in the extreme east.

36. There is an ill defined lower storey of sapling and pole stages of the overwood, and large shrubs, mostly spiny and often with xerophytic characters, extending down to low scrub of similar character. The species constituting the underwood are *Karai* (*Randia dumetorum*), *Kilakkai* (*Carissa carandas*), *Sempulichan* (*Erythroxylon monogynum*), *Vedathalam* (*Dichrostachys cinerea*), *Veppula* (*Securinega leucopyrus*), *Kattu elimichai* (*Atalantia monophylla*), *Vellakumil* (*Gmelina asiatica*), *Avaram* (*Cassia auriculata*), *Virali* (*Dodonea viscosa*), *Puchedi* (*Lantana camara*) and *Pullavaram* (*Mundulea sericea*). Herbaceous growth or grasses are scanty and are present for a short period during the monsoon. The soil is black cotton and extremely shallow, and bouldery outcrops of limestone, kankar and gneissic rocks are frequently seen. These forests are subjected to much degradation by biotic factors like heavy grazing, trampling and illicit removals. The Ettimadai ex-panchayat forests and extensive areas in the Thenkaradu, Ayyaswami South, Ayyaswami North, Marudamalai and Ichikuli Blocks and portions of the Thenkaradu, Konamalai, Kuthady and Kallar Blocks fall under this classification. The areas around Marudamalai, Chinnamalai, Ichikuli and Madukarai are particularly overgrazed.

37. *Artificial regeneration.*—From 1933 onwards, efforts were made to regenerate the areas worked for fuel with various indigenous dry fuel species by the 'rab' method. Only *Manjakonnai* (*Cassia siamea*) has established itself well. More recently, special regeneration areas (Conservator's plots) were selected for intensive regeneration near Madukarai, Ettimadai and Marudamalai where patchy young crops are to be seen. The details of planting are analysed in Chapter V.

(b) *The Mixed Deciduous Forests.*

38. The forests west of the Chunnambu Odai in the Walayar Valley and bulk of the forests in the heart of the Bolampatti Valley below an elevation of 3,500 feet (1,066 metres) consist of a good growth of mixed deciduous species. The more important species are *Vagai* (*Albizzia lebbek*), *Karuvagai* (*Albizzia odoratissima*), *Velvagai* (*Albizzia procera*), Venteak (*Lagerstroemia lanceolata*), *Thadasu* (*Grewia tiliaefolia*), *Pillamarudu* (*Terminalia paniculata*), *Palai* (*Wrightia tinctoria*), *Vengai* (*Pterocarpus marsupium*), *Rosewood* (*Dalbergia latifolia*), *Thani* (*Terminaia belerica*), *Velvelam* (*Acacia leucophloea*), *Othalai* (*Acacia suma*), *Aya* (*Holoptelea integrifolia*), and less commonly teak (*Tectona grandis*). Teak forms a considerable proportion of the growing stock in the Waterfall Block of the Walayar Valley, but is not frequently seen in its natural state in the Bolampatti Valley. The reverse is the case with Rosewood which occurs in fair proportions in the Bolampatti Valley but is seldom seen in the Walayar Valley. In general, the forests are predominantly of the South Indian dry deciduous type—Champion type 4a/C2, but patches of moist deciduous forests occur towards the west in sheltered locations along higher elevations like Punganchery, the Kalkothipathy Valley, near Adivaram and

Ittimarathupalam in the Bolampatti Valley, and the higher reaches of the Waterfall Block in the Walayar Valley where the conditions are moister with the deciduous forest merging with the evergreen and the semi-evergreen types. Such a transitional moist deciduous belt between the dry deciduous and evergreen zones is absent in the forest north of the Coimbatore-Siruvani Road in the Bolampatti Valley where the conditions are distinctly drier. The dry deciduous forest seen along the undulating country at the foot of the hills abruptly gives way to the semi-evergreen type along with the increase in elevation. The moist deciduous patches are characterised by an increase in the preponderance of species like Teak, *Manjakadambal* (*Adina oordifolia*) and *Pillamarudu* (*Terminalia paniculata*) in the Walayar Valley, and *Vengai* (*Pterocarpus marsupium*), Dalbergias, Venteak (*Lagerstroemia lanceolata*) and *Pillamarudu* (*Terminalia paniculata*) *in the* Bolampatti Valley. *Vengai* (*Pterocarpus marsupium*) and Rosewood (*Dalbergia latifolia*) are found in increasing numbers and not frequently in large sizes as one gets up to the 2,500 feet (1,066 metres) level in specially sheltered locations like Punganchеrry and the Kalkothipatty valley. It is however not the typical South Indian moist deciduous type (described by Champion under type 3a/C1) that one encounters in the West Coast, as associate species like *Karumarudu* (*Terminalia tementosa*), *Irul* (*Xylia Xylocarpa*) and *Nai Teku* (*Dillenia pentagyna*) so characteristic of the latter are totally absent.

39. The bamboos met with are *Perumungil* (*Bambusa arundinacea*) and *Kalmungil* (*Dendrocalamus strictus*). In the Walayar Valley, the male bamboo is restricted to the plains and gradually diminishes in occurrence with increased elevation, but a considerable proportion of *Perumungil* (*Bambusa*) occurs in the higher elevations where with the increase in moisture, the dry deciduous forest gives way to the moist deciduous type. However, in the Bolampatti Valley (where the conditions are drier than in the Walayar Valley), *Kalmungil* (*Dendrocalamus strictus*) is the predominant bamboo even at elevations upto 3,500 feet (1,066 metres) and *Perumungil* (*Bambusa arundinacea*) is comparatively scarce except in the most deciduous patches near Parapatti and the Kalkothipathy Valley.

40. Gregarious flowering of *Kalmungil* (*Dendrocalamus strictus*) in the Sholakarai Block and the lower portions of the Thenkaradu Hill has commenced in 1957, and it remains to be seen whether the flowering may spread to the Waterfall Block and to the Bolampatti Valley. Dead bamboo clumps may still be seen in places in the Sholakarai Block.

41. A sprinkling of sandal (*Santalum album*) is seen in the Sadivayal and Singapathy Blocks, but their heartwood content is very much less apparently owing to the moister conditions prevalent here than in the typical sandal forests. These trees are said to have spread from seeds originally dibbled around Sadivayal by students of the Madras Forest College.

42. The lower storey consists of sapling and polestages of the overwood and large shrubs like *Nona* (*Morinda tinctoria*), *Veppula* (*Securinega leucopyrus*), *Zizyphus* species. *Pavattai* (*Pavetta indica*), and *Gardenia* species in the drier localities, and species like *Pavattai* (*Welbera corymbosa*), *Kamala* (*Mallotus philippensis*), *Miliusa tomentosa* and *Vellathi* (*Bauhinia Malabarica*) *in the moister localities*. *Puchedi* (*Lantana camara*) and *Indu* (*Acacia intsia*) are seen in either localities often forming an impenetrable mass in coupes worked in the past and near Irular settlements, and suppress regeneration badly.

43. In the drier localities, herbaceous growth are scanty or absent, but such species as *Vattakanni* (*Clerodendron viscosum*), *Nekku* (*Leea indica*), *Ageratum conyzoides*, *Sundakkai* (*Solanum trilobatum*) occur in the dense patches stifling the growth in most places.

44. Woody climbers such as *Kattuavaraikodi* (*Butea parviflora*), *Butea superba*, *Derris* species and *Calycopteris floribunda* are commonly seen all over the deciduous forests.

45. Natural regeneration of valuable species in the deciduous forests is inadequate and requires augmentation.

46. *Artificial regeneration*: Efforts have been made from early times to cover suitable areas in the deciduous forests into more valuable plantations by clear-felling and artificial regeneration. Accordingly, suitable areas in the fuel series were regenerated with various fuel species. Of these *Manjakonnai* (*Cassia siamea*) has come up well but the other fuel species have not been quite as successful. In the better soil sites, plantations of teak and other hardwoods such as *Karumarudu* (*Terminalia tomentosa*), *Vengai* (*Pterocarpus marsupium*) and *Karuvagai* (*Albizzia odoratissima*) were raised under the '*Ponam*' method. Teak planting was abandoned in 1947 but was again revived from 1957 onwards. In all, an area of 871·02 acres (352·49 hectares) has been planted with teak and other hardwoods.

47. Since 1953, suitable areas in the fuel and bamboo series including some of the old *Manjakonnai* (*Cassia siamea*) plantations have been clear-felled and planted with soft-woods like *Pimaram* (*Ailanthus excelsa*) and *Poola* (*Salmalia malabarica*).

48. The details of the planting schemes and their results are analysed in Chapter V

(*c*) 1 *a/C3 The Western Tropical Evergreen forests.*

49. The typical tropical evergreen or 'rain forest' is characterised by its luxuriance of vegetation consisting of several tiers, the highest containing tall trees, and the lowest containing dense shrubby under-growth. A heavy rainfall, high humidity, and a short dry season are characteristic of this type. In small patches on the upper slopes of Bolampatti Block II Reserve Forest, on the Varadimalai plateau and along the valleys of the Walmukkiar, the Kanavaraiar, the Noyilar, the Anear, the Chinnar and the Mundanthorai Ar (where the locality factors approach to what is described above) we see evidence of the shola forests. The sholas are not so dense or luxuriant as the typical west-coast evergreens as the high ranges keep off much of the rain which would otherwise fall on these hills and consequently, are restricted to elevations over 4,000 feet (1,219 metres) where they are windswept thereby considerably reducing the height of the overwood. At elevations above 5,000 feet (1,524 metres), the tropical evergreen forest degenerates into the high level shola (sub-tropical evergreen) type. However, in the typical sholas occurring at 4,000–5,000 feet (1,129–1,524 metres) above sea-level, 3 tiers are by no means uncommon. *Vellakunthirikam* (*Vateria macrocarpa*), *Malamkonnai* [*Acrocarpus fraxinifolius*], *Pali* (*Palaquium ellipticum*), *Nangu* (*Mesua ferrea*), *Vedipila* (*Cullenia rasayroana*), *Syzygium* species, *Cholavengai* (*Bischofia javanica*), *Santhanavembu* (*Cedrela toona*), *Pila* (*Artocarpus heterophyllus*), *Aglaia species*, *Litsea stocksii*, etc., from the overwood. Very often a preponderance of species, like *Malamkonnai* (*Acrocarpus fraxinifolius*), *Cholavengai* (*Bischofia javanica*) and *Santhanavembu* (*Cedrela toona*) is seen indicating a descent into the semi-evergreens.

50. In the second storey are usually present smaller trees like *Shempuvan* (*Euphoria longana*, *Vattai* (*Macaranga peltata*), *Litsea stocksii*, *Glochidion malabaricum*, *Maravetti* [*Hydnocarpus laurifolia*], *Syzygium* species, *Nedunare* (*Polyalthia coffeoides*). *Nekkini* (*Canthium dicoccum*), *Manikulikki* (*Agrostistachys longifolia*) and *Thali* (*Actinodaphne hookeri*).

51. The shrubby third storey is represented by *Nekku* (*Leea indica*), *Vatakkanni* (*Clerodendron viscosum*), *Syzygium* species, *Anaichoriyan* (*Laportea crenulata*), *Vettilat pattai* (*Callicarpa lanata*), *Kurinji* (*Strobilanthes species*), *Webera* species, etc.

52. The monocotyledons are represented by *Alampanai* (*Arenga wightii*), *Kanakamuku* (*Pinanga dicksonii*), *Calamus* species, *Thazhi* (*Pandanus furcatus*) and herbaceous species like wild arrowroot and some of the *Araceae*. *Itakalli* (*Ochlandra beddomei*) the common Malabar Reed is occasionally met with between Mylon's bungalow and the Muthikulam Pass.

53. Climbers which are not as abundant or as numerous as in the deciduous forests are represented by *Anapendu* (*Gnetum scandens*), *Smilax zeylanica*, *Derris* species, *Cillu* (*Entada phaseoloides*), etc.

54. Herbaceous groundflora are meagrely represented within the sholas by *Curcuma* species and *Haeckeria subpeltata*.

55. Two distinct associations can be recognised within the Bolampatti evergreen forests :

(1) *The Vateria-Cullenia association.*

(2) *The Mesua-Calophyllum association.*

56. (1) *The Vateria-Cullenia association.*—This community, the dominant species of which is *Vellakunthirikam* (*Vateria macrocarpa*) is the more widespread of the two associations occuring within the area. It occurs at elevations of about 4,000 feet (1,219 metres) along streams throughout the Bolampatti Block II R.F. with pure patches of *Vateria* of good quality, but reaches its best form in the Kuppudukkal Shola where specimens of *Vateria* of enormous dimensions are seen.

57. The co-dominants are *Vedipila* (*Cullenia rosayroana*), *Pali* (*Palaquium ellipticum*), *Nangu* (*Mesua ferrea*), *Nedunarai* (*Polyalthia coffeoides*), *Kattupinnai* (*Calophyllum elatum*) and an occasional *Vayal* (*Poeciloneuron indicum*). At lower elevations the predominant mixture is that of *Cullenia* and of *Palaquium* of smaller diameter classes, while at the higher elevations there is a comparatively large percentage of *Mesua ferrea*.

58. In wet localities above 4,500 feet (1,372 metres), *Vateria* is again found almost pure, but stunted and of a distinctly poorer quality.

59. (2) *The Mesua-Calophyllum association.*—This association is seen at elevations above 3,750 feet (1,143 metres) in the sholas on the Varadimalai plateau of Bolampatti Block II Reserved Forests. Both *Mesua* and *Calophyllum elatum* struggle on in a stunted form up to 5,000 feet (1,524 metres) where the tropical rain forest merges into the sub-tropical evergreen.

60. The co-dominants in this association are *Vellakunthirikam* (*Vateria macrocarpa*), *Syzygium* species, *Shempuvan* (*Euphoria longana*), *Pali* (*Palaquium ellipticum*), *Pila* (*Artocarpus heterophyllus*), *Chola Vengai* (*Bischofia javanica*) and *Malamkonnai* (*Acrocarpus fraxinifolius*). In the eastern most slopes of Bolampatti Block II Reserved Forest where the rainfall is much lower, *Palaquium* is almost negligible, but *Vateria* prevails instead atleast along perennial streams.

61. There is a marked change in the associated species and the under-growth with increasing elevation. At elevations above 4,500 feet (1,372 metres), the associates are mainly *Lietse stocksii*, *Liasea oleoides*, *Gordonia obtusa*, *Syzygium* species, *Cinnamomum sulphuratum*, *Kamblivetti* (*Symplocos laurina*) and *Thali* (*Actinodaphne hookeri*). The understorey is characterised by a heavy growth of *Strobilanthes* of several species up to 20 feet (5½ metres) high, which retards regeneration considerably.

(d) ~~7~~ 8 a/C1 *The Nilgiri Sub-tropical evergreen forests.*

62. This type is usually distinct above an elevation of 5,000 feet (1,524 metres), although a transition stage may be distinguished between 4,500 feet (1,372 metres) and 5,000 feet (1,524 metres) with characteristics intermediate between tropical rain forests and sub-trophical evergreens. This type occurs in small patches on the Periakunjiramalai, Vellingiri, Thembumalai, Varadamudi and Koppudukalmalai.

63. The sub-tropical evergreen forest has often been described as a 'stunted rain forest' similar to the rain forest but not so luxuriant, the trees being smaller and with less shapely boles, and often festooned with lichens, mosses and herbaceous epiphytes although species like *Kattupinnai* (*Calophyllum elatum*), *Thali* (*Actinodaphne hookeri*), *Litsea stocksii*, *Cinnamomum sulphuratum*, *Nekkini* (*Canthium dicoccum*) *and Syzygium* species are seen. With increase in elevation, *Poomaram* (*Rhododendron arboreum*), *Kamblivetti* (*Symplocos laurina*), *Ilex denticulata and Kolakkai* (*Gaultheria fragrantissima*) and other species common to the Nilgiri Southern Wet temperate forests make their appearance, as may be seen on top of the Vellingiri and the Periyakunjiramalai.

64. A dense growth of *Strobilanthes* species, forming extensive thickets of undergrowth are characteristic of this type.

Section 2—Injuries to which the crop is liable.

65. *Climatic.*—Unusual delay in the out-break of the south-west monsoon prolongs the fire season and increases the danger from fire.

66. The strong westerly winds which precede the south-west monsoon and continue to blow until the north-east monsoon sets in, do considerable damage to the young teak and softwood plantations in the Bolampatti valley, and to coppice and natural regeneration in the felled fuel coupes all over the range by breaking the tips of the seedlings generally taller than the average or by bending them over the rest. Such damaged stems have to be cut back in many cases. Often the wind causes a circular movement especially of the smaller seedlings with the result that their root systems get loosened and consequently suffer rot from accumulation of rain water around them.

67. The westerly winds, in particular, help to disperse the seeds of several species of weeds belonging to the Comppositae notably *Ageratum conyzoides* with the result that heavy weed growth spreads into new plantations.

68. *Fire.*—The plain portions in both the valleys are generally free from fires.

69. Fires are fairly common on the grassy hill slopes along the deciduous forests in both the valleys, caused mostly by graziers or collectors of minor forest produce. The Kocchimalai beat is particularly notorious for fires. These fires scorch standing trees, destroy natural regeneration and eat into the sholas.

70. Grass land in the sholas is very susceptible to fire. However no records are available of the monthly incidence of fires during the decennium 1950 to 1960.

71. *Injurious plants.*—There is some *Pulluruvi* (*Dendrophthoe* syn. *Loranthus*) on teak, but not on any extensive scale.

72. *Lantang* is a serious pest in the teak in the plantations in the Bolampatti valley, in the worked coupes of the Singapathy Fuel Series, and in the neighbourhood of Irular settlements, generally. It hinders regeneration and makes inspection difficult.

73. *Kattu avaraikodi* (*Butea parviflora*), *Butea superba*, *Derris species*, *Karu indu* (*Pterolobium indicum*), *Churimullu* (*Zizyphus oenoplia*), *Indu* (*Acacia intsia*) and *Siyakayi* (*Acacia concinna*) are the common climbers. The thorny climbers are a menace to coppice regeneration in the fuel coupes and sometimes in the plantations.

74. Bamboo regrowth competes seriously with coppice and seedling regeneration in the fuel coupes and plantations.

75. *Puchedi* (*Lantana camara*) and *Ageratum conyzoides* are seen to spread enormously during recent years in the softwood plantations particularly in the Mullangadu beat. It is difficut to control these weeds as they are easily dispersed by winds during the south-west monsoon.

76. *Strobilanthes* of various species infest the sholas hindering regeneration to some extent.

77. *Insects.*—The teak leaf defoliator *Hyblaea puera* and the teak leaf skeletonizer *Hapalia machaeralis* are present both in the teak plantations and in the fuel series in the Walayar valley containing teak. Beyond a possible loss of the year's increment no more serious damage is done. The teak canker grub *Dihammus cervinus* is also in evidence in the younger regeneration areas; but the damage is mostly sporadic and doesn't call for any special measures.

78. The *Ailanthus* defoliator *Eligma narcissus* is at times a serious pest in the soft-wood plantations and nurseries as it often assumes epidemic proportions soon after the north-east monsoon has abated. The plants are rendered at times completely leafless and even the tender buds are eaten up thereby seriously retarding growth. Sporadic damage to young plants of *Poola* (*Salmalia malabarica*) by the shoot borer *Tonica niviferana* is in evidence in both the nurseries and the younger regeneration areas.

79. In the evergreens, a *Buprestid* borer (*Chrysochroa* species) is seen to riddle *Nangu* (*Mesua ferrea*) trees by longitudinal and radial tunnels. The presence of the larva can be easily identified by the heaps of wood-dust at the base of each tree. The tunnelling results in wastage during conversion but since there has been very little of *Mesua* extraction in the recent past, the damage is not very significant economically.

80. The fruits and seeds of *Vellagil* (*Dysoxylum malabaricum*) are riddled by swarms of *Trypetid* grubs.

81. *Animals.*—Wild elephants knock down cairns, pull up coupe stones, tear up teak poles and strip the bark of teak, *Grewia* and other species, but the damage is not extensive.

82. Sambhur and spotted deer nibble away the young shoots of *Vengai* but the damage is not severe.

83. Black monkeys and Malabar squirrels destroy enormous quantities of seeds of *Vellagil* (*Dysoxylum malabaricum*) year after year considerably affecting the regeneration of this valuable species.

84. *Grazing.*—The grazing incidence has been worked out at an average of 2.05 acres (0.83 hectares) per cow unit for the whole range. This is correct in theory, but in practice the incidence varies inversely with the distance of the grazing area from the village. The eastern slopes of both the valleys are grazed heavily. The Ettimadai ex-panchayat forest is perhaps the worst sufferer in spite of the higher rates of grazing for this unit owing to the large number of cattle present round about Madukarai and the general proximity of these areas to Coimbatore. Over-grazing particularly by cattle effects regeneration both by nibbling of the tender shoots of young plants and the hardening of the soil due to trampling and consequent erosion.

85. *Goat browsing.*—Goat browsing still happens occasionally in the Ettimadai ex-panchayat forests and in portions of Karadimadai and Kempanur beats.

86. *Man.*—The deciduous forests in both the valleys are subjected to illicit removals of fuel, dead bamboos, and timber such as Teak, Rosewood, *Vengai* and *Porasu*. The Waterfall Block is particularly notorious for removal of teak trees. The culprits are mostly from the villages of Karadimadai, Mangalapalayam, Mathipalayam, Kalimangalam and Madampatti in the Bolampatti valley who cross over the hill slopes to the Walayar valley through the Kilikanuvai to commit the theft during the night and escape during the early hours of the morning.

87. The shola forests of Bolampatti Block II are comparatively free from illicit removals, except for occasional fellings of *Nangu* (*Mesua ferrea*) which is used for making plough shares.

88. The following statement shows the number of cases reported under the main heads for the decennium 1949–50 to 1959–60.

STATEMENT OF OFFENCES.

Nature of offence.

Year.	*Illicit felling.*	*Illicit collection of minor forest produce.*	*Illicit grazing.*	*Incendiarism.*	*Illicit hunting.*	*Violation of Timber Transit Rules.*	*Miscellaneous.*	*Total.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1950–51 ..	122	3	10	..	..	12	6	153
1951–52 ..	180	2	9	..	1	9	7	208
1952–53 ..	199	1	5	..	..	42	5	252
1953–54 ..	325	1	5	1	..	30	3	365
1954–55 ..	415	4	16	..	..	41	5	481
1955–56 ..	341	25	30	..	..	20	1	417
1956–57 ..	326	1	16	..	..	14	1	358
1957–58 ..	278	2	18	1	..	13	2	314
1958–59 ..	306	6	17	..	2	8	1	340
1959–60 ..	366	4	5	..	..	32	1	408
Total ..	2,858	49	131	2	3	221	32	3,296

89. The average annual revenue derived from compounding fees in the range during the above decennium was Rs. 3,776.62.

SECTION 3—FAUNA.

90. In general, the sholas are not much frequented by wild animals, probably because of the leeches that infest the forest floor during the greater part of the year. Nilgiri Langur, Malabar squirrels, Sloth bears and Sambhur are occasionally seen. Birds occur in large number however. The greater horn-bill, the Green pigeon, the Hill mynah, the Grey Tit, the Whistling School boy and the Scarlet Minivet are some of the common birds in the sholas.

91. In the deciduous forests, wild elephants are seen to wander in small herds in both the Walayar and Bolampatti valleys during the monsoons when they appear to descend down from the adjacent Vadasseri private forests in Malabar. The Sholakarai, Singapathy and Iruttupallam Blocks are favourite retreats during the rainy season, when they cause considerable scare to the subordinates and labourers at work in those areas. Bamboos are their favourite food, but they often raid the adjoining field crops. Sambhur, spotted deer, Mouse-deer, Wild bear and the Wild pig are common in both the valleys. The Carnivora are represented by the tiger, the panther and the wild dog which are, however, far from commonly seen. Birds of many varieties are to be seen everywhere. Some of the commoner birds are the Red Spurfowl, Grey junglefowl, the Imperial pigeon, the Green pigeon, the Painted Partridge and the Grey Partridge, Bulbuls, Orioles, Koels, barbets, jays, hoopoes and wood peckers.

92. There are numerous snakes, both poisonous and non-poisonous.

CHAPTER III—UTILISATION OF THE PRODUCE.

SECTION 1.—AGRICULTURAL CUSTOMS AND WANTS OF THE POPULATION.

93. *General description of the population.*—With the exception of the inhabitants of Coimbatore City, and its suburbs like Singanallur, Podanur and Madukarai, the surrounding population is mainly agricultural. Wet cultivation (paddy, sugarcane and tobacco) is confined to small areas irrigated by the Noyilar and from village tanks and streams. Along the banks of the Noyilar, coconut and areca palms are grown extensively along with plantain.

94. The chief dry crops are cotton, groundnut, castor, chicory, gram and millets.

95. In the city of Coimbatore, the population is ever on the increase on account of its rapid industrial growth during the past two decades, and the steady influx of people from Malabar coming in search of employment. The population of Coimbatore increased from 1,30,348 in 1941 to 1,97,755 in 1951; it is probably over 2½ lakhs now and is still increasing.

96. *Hill tribes.*—The local jungle tribes are the 'Irulars' and the 'Muduvars'. There are a number of settlements of these tribes inside the reserves with land set apart for their cultivation. They raise millets generally but a little paddy is also grown in places. A statement showing the number of their settlements, the areas of lands leased out to them and the number of cattle which they are allowed to graze free will be found in paragraph 152 of Chapter IV of Part I. They are permitted to collect minor produce from the reserves for their own use, and to cut third-class timber for domestic and agricultural purposes.

97. *Wants of the population.*—The villagers require small timber for building purposes, carts and agricultural implements, bamboos, firewood and grazing grounds. A large proportion of the villagers' requirements of fuel however is met from trees grown in their own fields, from cow dung, sugarcane and castor-stalks, coconut leaves, etc. Teak poles are required as posts and rafters for houses and cattle sheds and in large numbers for frames to cure tobacco on, or for drying chicory.

98. The demand for fuel in the industrial city of Coimbatore is ever on the increase on account of its increasing population. Practically all the major industrial undertakings in the city use electricity as a source of power, but the large amount of labour employed by these industries require firewood as fuel for domestic use. Cottage industries like jaggery-making, lime and brick-kilns, potteries, tanneries, the weaving industry and the Central Jail at Coimbatore require appreciable quantities of firewood.

99. Timber of ordinary as well as better quality is required in large quantities for construction and furnishing of ordinary as well as superior houses and buildings for housing industries in the city of Coimbatore although of late steel is being preferred over timber by the more affluent classes.

100. There is also a large demand for bamboos of all kinds both at Coimbatore and in the surrounding agricultural villages.

101. The tanneries at Coimbatore use *avaram* (*Cassia auriculata*) bark and gall-nuts (*Terminalia chebula*) fruits for tanning hides and skins, in addition to wattle bark imported from the Nilgiris.

SECTION 2—MARKETS AND MARKETABLE PRODUCTS.

102. *Markets—Coimbatore.*—Coimbatore is the chief market for the forest produce of the range both major and minor, excepting teak poles. The range by itself is not capable of catering to the needs of the town, and the bulk of its demands is met from the Kerala State forests, the Anamalais and the private forests in the Attapadi Hills.

103. The average annual consumption of firewood in the city of Coimbatore is about 1,00,000 tons (1,01,605 metric tonnes) of which about only 6,000 tons (6,096 metric tonnes) are supplied by the forests of the range, the balance being met from other sources referred to above.

104. *Ondiputhur.*—Ondiputhur, near Singanallur, is the most important market for teak poles. Practically all the output of teak poles from the Bolampatti plantations go to this market for sale. Most of the demand is for straight poles 6 to 8 inches (15.2 to 20.3 cms.) in girth at the base and 10 to 14 feet (3.05 to 4.27 metres) in length popularly known as 'Oosi-kal'. Singanallur market supplies 'Oosi-kal' to almost all the tobacco growing areas of Coimbatore district and poles of larger sizes to Tirupur, Erode, Salem, Tiruchirappalli and other places.

105. *Alandurai.*—Alandurai is the biggest village in the Bolampatti Valley where there is some sale of firewood locally. Contractors of coupes in the Bolampatti Valley are mostly from this village and maintain depots here for the sale of timber and other forest produce to the local population and for sale to the retail dealers at Coimbatore and other places.

106. *Chavadi.*—Contractors of coupes in the Walayar Valley are mostly from this village. Depots are maintained by them at Walayar or at Sholakarai. There is some sale of fuel at Chavadi and at Madukarai which are the chief places in the valley.

107. Apart from these important villages and towns there is not much sale of fuel to the people of the village who mostly depend for their fuel supplies from trees grown in their fields, sugarcane, cholam and castor stalks, coconut and arecanut leaves, coconuts husks and shells, etc.

108. *Marketable products.*—Large and medium sized timber of Teak, Rosewood, *Pillamarudu*, *Vengai*, *Karuvagai*, *Manja kadambai*, Venteak, and *Thadasu* find a ready market at Coimbatore or in the district. The output of timber from our forests is but a small proportion of the demand, the bulk of the supplies coming from the West Coast and the Anamalais. There is a great demand from the State Electricity Board for straight grown teak poles for use as electric transmission poles in the State Rural Electrification Schemes. These are however in short supply as straight grown poles of the specified length are not available from the Bolampatti teak plantations which are mostly of low site quality and have a tendency for early branching.

109. Apart from the 'Oosikal' variety, teak poles of 8 inches (20.3 centimetres) in girth will find a ready market if straight and about 16 feet (4.88 metres) long or over. Poles of other species can be marketed to a limited extent but they are not in great demand as poles. As timber, however there is good demand for practically all the hard-woods.

110. Firewood and charcoal can be sold up to the maximum output from the forests dealt with and so can bamboos, both *Kalmungil* (*Dendrocalamus strictus*) and *Perumungil* (*Bambusa arundinacea*).

111. Bamboos find a ready sale at Coimbatore. They are also exported to Tiruchirappalli, Madurai and other places.

112. Tamarind, *Avaram* (*Cassia auriculata*) bark, *shekoy*, honey and wax, gallnuts (*Terminalia chebula*) fruits and *Peypodal* (*Trichosanthes cucumerina*) fruits are the chief minor forest produce collected by lessees.

113. A small quantity of canes (*Calamus rotang*) and reeds (*Ochlandra beddomei*) occur in the sholas. They are readily marketable at Coimbatore for various cottage industries such as rattan and basket manufacture, but the bulk of the demand is met from the Kerala forests.

SECTION 3—LINES OF EXPORT.

114. *Roads.*—Communications in the Coimbatore taluk are well developed as in the rest of the district. There is a good net work of roads and cart-tracks maintained by the respective Highways, Municipal, District and Panchayat Board authorities which are supplemented by forest roads and cart-tracks at certain places.

115. The main export route for the Bolampatti Valley is the Coimbatore-Siruvani road which has a total length of 28 miles and 2 furlongs (45.46 kilometres) within the Madras State along the right bank of the Noyilar. Ten miles and 6 furlongs (16.09 kilometres) of this road at its western end is maintained by the Forest Department. Alandurai, 14½ miles (23.24 kilometres) from Coimbatore on this road, is the centre where contractors maintain depots for the sale of timber, bamboo and fuel to the local villagers and for transport for sale at Coimbatore. This road also serves to export timber from the Muthikulam forests in Kerala. The Kerala Forest Department pays a contribution to this department for the maintenance of the forest portion of the road. A metalled road along the left bank of the Noyilar runs from Coimbatore to Narasapuram and helps to export forest produce from the northern side of the valley. Fair weather earthern roads and cart tracks radiate into the forest from both these roads, which are themselves connected by some half a dozen fordable tracks and a metalled road across the Noyilar.

116. The Coimbatore-Palghat road is the chief road for extraction from the Walayar Valley and for forest produce coming to Coimbatore market from the forests in Kerala State. The Sengalpallam cart-track connects this road with the Sholakarai Block. The Waterfall Block is fed by the Chavadipara road, but the route is circuitous in the sense that it traverses through the Varalapadi forest in Kerala State and joins the main trunk road.

117. The Coimbatore-Siruvani road is also connected to the Coimbatore-Palghat road by a cross road from Madukarai passing through the village of Sundakamuthur. Cart-tracks from this road lead to the eastern and southern portions of the Ettimadai Ex-panchayat forests.

118. *Rail routes.*—The system of roads mentioned above is reinforced by the railway line connecting Coimbatore with Olavakkot.

119. *Inspection paths in the shola forests.*—A few inspection paths in the evergreen forests are being maintained year after year. Most notable of them is the Kanavarai path leading to the Kanavarai Estate in Kerala and the Vellingiri path from Poondi to Vellingiri Peak. Apart from serving the public, these paths provide at present the only means by which the interior of these forests can be inspected.

120. *Inspection paths in the deciduous forests.*—The deciduous forests are traversed by innumerable paths. They are mostly cattle-paths, but they serve the hill-tribes, men collecting minor forest produce and bamboos, forest officials on inspection and also the timber smuggler.

SECTION 4—METHODS OF EXPLOITATION AND THEIR COST.

121. *Fuel and small timber.*—Fuel and small timber are obtained from the simple coppice and plantation coupes, entirely through the agency of contractors. The general practice adopted is the same as prevalent elsewhere in the State and is briefly stated below.

122. The annual coupe is surveyed and demarcated on the ground in accordance with the working plan map and is divided according to its size into 3 or 4 strips. On receipt of permission to start working, the contractor starts felling in strip I. The contractor

first proceeds to clear all undergrowth and fell all coppice and tree growth except reserved trees flush with the ground. The fuel and small timber are billeted and arranged in stacks sizing 6 feet by 5 feet by 3 feet (1.83 metres by 1.53 metres by 0.92 metre) approximating to nearly 2 tons (2.03 metric tonnes) in weight. All this work is done on contract by mazdoors and the rates generally paid are Rs. 4 per stack. The fuel and small timber are then transported from the coupe either by cart or by lorry depending upon the nature of the feeder road to the sale depots. Most contractors maintain their own lorries or hire lorries for the purpose. Carts are employed only where the roads are unfit for lorries but practically all fuel series can be reached by lorries during fair weather. In the case of lorries owned by the contractors themselves, apart from the propulsion charges loading and unloading charges have to be paid at either end amounting generally to Rs. 3 per trip. In case hired lorries are arranged, a rate of up to Rs. 2 per mile or Rs. 1.39 per kilometre is paid to the lorry. Carts are generally hired and the hire charges are Re. 0.52 per mile (to and fro). The sale depots are at Alandurai in the Bolampatti Valley and Sholakarai in the Walayar Valley from where fuel or timber is delivered on contract to retailers at Coimbatore or large consumers such as the District Jail or some of the local cottage industries.

123. In the better fuel series where some quantity of large timber is obtained, the trees are felled, rough-squarred at stump site, dragged by buffaloes or elephants to the cart or lorry and loaded for transport to the sale depots. This work is done by a separate set of mazdoors paid at a rate of Rs. 4.50 per candy of miscellaneous timber (1 candy = 13 cubic feet or 0.37 cubic metre) and Rs. 6 per candy of Rosewood timber. The cost of transport is the same as for fuel or small timber but a rate of Rs. 10 per lorry load is paid for loading and unloading at either end.

124. Usually contractors employ agents for engaging mazdoors and supervising all work. Agents are paid about Rs. 60 per month.

125. On satisfactory completion of felling in strip I, the contractor is allowed to commence work in strip II and so on, provided he has paid all his dues under the terms of the contract.

126. Brushwood and faggot fuel of small dimensions are mostly collected by the contractors engaging a separate set of mazdoors paid at the rate of Rs. 1.50 per day and transported to the depots. Otherwise such fuel is sold to the local population under cover of headload permits, but a perusal of the timber records show that no sale of headload permits have been made during the last decade.

127. *Teak plantations*.—At every thinning that any plantation is subjected to, all saleable produce is converted into timber, poles and fuel for sale.

128. For the first two thinnings which are mechanical, the trees in the lines meant for cutting, i.e., the alternate diagonal or the alternate planting lines, as the case may be, are felled at a flat rate of Rs. 5 per acre. For the silvicultural thinnings, trees to be removed are marked by the marking officer. These are felled at a rate of 4 paise per tree.

129. The thinned produce is converted into poles, adopting the classification given below, and paid at the rates noted against each :—

Classification. (1)	*Conversion charges.* (2)
Poles below 18" (45 cms.) in girth at butt end .. .. — —	Rs. 8 per hundred.
Poles above 18" (45 cms.) and below 24" (60 cms.) in girth at butt end.	Rs. 8 per hundred.
Poles above 24" (60 cms.) and below 36" (90 cms.) in girth at butt end ..	Re. 0·16 per pole.
Poles above 36" (90 cms.) in girth at butt end	Re. 0·50 per pole.

130. The poles thus obtained are mostly of teak although a small quantity of miscellaneous poles are also obtained while thinning the small miscellaneous patches inside the plantations.

131. The converted poles are dragged to a road-side depot outside the plantation and are arranged as per the classification given above by a set of mazdoors who are paid at the following rates :—

Category of pole. (1)	*Charges for dragging over an average lead of 2 furlongs (0·402 kilometres) to road-side depot and arranging.* (2)	
Poles below 18″ (45 cms.) in girth at butt end	Rs. 10 per hundred.	
Poles above 18″ (45 cms.) and below 24″ (60 cms.) in girth at butt end ..	Rs. 15	Do.
Poles above 24″ (60 cms.) and below 36″ (90 cms.) in girth at butt end ..	Rs. 24	Do.
Poles above 36″ (90 cms.) in girth at butt end	Rs. 24	Do.

132. The top ends, and such of those trees unsuitable for being converted into poles on account of being too slender or crooked are billetted into fuel, carried to the roadside depot and stacked in sizes of 6 feet by 5 feet by 3 feet (1.83 metres by 1.53 metres by 0.92 metres) at a rate of Rs. 4 per stack.

133. The converted poles are sold in auction, each class of poles obtained from a plantation being treated as a separate lot. The entire fuel obtained from each plantation is sold in one lot. Locally there is a good demand for teak poles of all categories if they are sold quickly after conversion.

134. *Bamboos.*—The exploitation of bamboos is entirely through the agency of contractors. Bamboo coupes are leased out to contractors who employ labour for collection under the supervision of an agent, who is paid about Rs. 60.00 per mensem. Cutter's chits are issued by the contractor to the labourers to authorise their entry into the reserve forest. Bamboos of different sizes are extracted from the leased out coupes and dragged in bundles of 25 or so to road-side depots, from where they are transported by cart or lorry to the sale depots at Alandurai in the Bolampatti Valley and at Sholakarai in the Walayar Valley. Dead bamboos which cannot be utilised whole are split and tied into bundles and transported for sale as fuel. A small quantity of green bamboos is also split for sale as fencing material. The following rates prevail for the collection of bamboos :—

Description of size. (1)	*Felling, collection and delivery charges at road-side depot.* (2) RS.	P.	
Bottom pieces 18 to 29 feet (5·49 to 6·01 metres) long and 18 to 24 inches (45·7 to 61·0 cms.) in girth (*Yettukolethattai*).	50	00	per hundred.
Bottom pieces 15 to 20 feet (4·57 to 5·49 metres) long and 18 to 24 inches (4·57 to 61 cms.) in girth (*Arukolethattai*).	25	00	Do.
Bottom pieces 12 to 14 feet (3·66 to 4·27 metres) long and 9 to 12 inches (22·9 to 30·5 cms.) in girth (*Aruvatheri*).	16	00	Do.
Bottom pieces 15 to 17 feet (4·57 to 5·18 metres) long and 12 to 15 inches (30·5 to 38·1 cms.) in girth (*Ambatheri*).	25	00	Do.
Bottom pieces 10 to 14 feet (3·05 to 4·27 metres) long and below 6 inches (15·2 cms.) in girth (*Nooreri*).	10	00	Do.
Top pieces 10 to 15 feet (3·05 to 4·27 metres) long and 3 to 6 inches (7·62 to 15·00 cms.) in girth (*Nathi*).	5	00	Do.
Splits (*Dabbai*)	Rs. 2·00 per bundle of hundred.		
Dead bamboos	Rs. 5·00 per cart load.		

135. The cost of transport by cart or lorry is the same as for fuel and small timber.

136. *Minor Forest Produce.*—The minor forest produce items are leased out year after year. The collection of the various minor forest produce items is through labour specially employed for this purpose who are paid for the quantity collected. Collection of honey is essentially a prerogative for the Irulars and Muduvars, for they are adept in this work and the art of honey collection is passed on from father to son. Collection of other minor forest produce like tamarind, *avaram* (*Cassia auriculata*) bark, *peypodal* (*Trichosanthes cucumerina*), etc., is done by village labour specially employed for the purpose. Contractors pay for the collection of different kinds of minor forest produce at the following rates.—

Description of items. (1)	*Collection and delivery charges at road-head or depot.* (2)	
	RS. P.	
Honey	1 25	per Coimbatore measure.
Wax	1 00	per lb.
Tamarind	3 00	per bag.
Avaram	2 00	per maund.
Soap-nut	0 12	per Coimbatore measure.
Peypodal	2 00	per maund.

137. For quarrying, specially skilled stone-cutters are employed by the lessee. The stone is blasted by a special set of blasting mazdoors. The blasted stone is broken down into small bits called ' Rough stone '. In lime stone quarries, the stone is transported as such to the cement factory at Madukarai by lorries from the quarry site. In the other quarries where granite is involved, the blasted stone is rough-squarred by skilled stone-cutters and then transported.

138 The stone-cutters are paid on piece-work at the following wages :—

Item of work. (1)	*Charges paid per unit.* (2)	
	RS. P.	
Blasting	5 00	per 1000 c.ft.
Collection of rough stone	8 00	Do.
Dressing to soling stones	19 00	Do.
Dressing to bond stones	20 00 to 25 00	Do.

N.B.—100 c.ft. =2·84 metres.

139. Practically all exploitation consists in selling the standing crop in the forest to contractors in public auction, except in the case of materials obtained after thinning in teak plantations where departmenal working is done. This has been the practice for nearly three decades now.

SECTION 5—PAST AND CURRENT PRICES.

140. *Fuel.*—The prices realised for the various fuel series from 1949–50 to 1959–60 are exhibited in the subjoined statements.

Prices realised for fuel coupes per acre.

NAME OF FUEL SERIES.

Year of working.	*Thenkaradu.*		*Chavadi.*		*Mangala-palayam.*		*Iruttu-pallam.*		*Poondi.*		*Kallar.*	
	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.
1950–51	83	00	20	75	82	00	230	00	857	00	96	00
1951–52	210	50	24	00	..		260	00	912	00	118	00
1952–53	765	00	..		..		..		705	00	181	00
1953–54	464	00	..		62	00	..		290	00	53	00
1954–55	395	00	..		..		..		261	00	104	00
1955–56	480	00	..		..		..		804	21	105	00
1956–57	764	00	..		..		..		..		..	
1957–58	409	92	..		..		..		..		..	
1958–59	288	83	..		..		..		..		..	
1959–60	200	00	..		..		..		..		..	

	Ichikuli.		*Singapathy.*		*Vellapathy.*		*Kalkothi-pathy.*		*Walayar.*	
	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.
1950–51	31	00	100	50	1,300	50	165	00	145	00
1951–52	16	87	146	56	1,673	00	197	50	144	00
1952–53	27	00	..		1,454	00	160	00	745	00
1953–54	29	03	..		545	00	68	00	427	00
1954–55	..		..		..		248	00	630	00
1955–56	..		..		183	00	801	00	821	00
1956–57	..		..		922	00	..		595	67
1957–58	..		..		2,014	00	..		..	
1958–59	..		..		1,404	00	..		..	
1959–60	..		..		1,253	00	..		..	

	Mullangadu plantation coupe.		*Mullangadu Cassia siamea series.*		*Kallar Cassia siamea series.*		*Singapathy Cassia siamea series.*		*Iruttupallam Cassia siamea series.*	
	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.
1950–51	..		16	00	8	50	12	00	291	60
1951–52	..		12	00	86	00	5	25	132	00
1952–53	..		5	00	28	25	8	00	100	00
1953–54	..		5	00	47	00	8	00	77	00
1954–55	55	66	..		..		..		..	
1955–56	52	74	..		..		..		..	
1956–57	113	28	..		..		..		..	
1957–58	178	18	..		..		..		..	
1958–59	43	15	..		..		..		..	
1959–60	233	48	..		..		..		..	

141. The prices fetched for bamboo coupes between 1950–51 and 1959–60 are given below :—

Year.	Savakad. RS. P.	Sadivayal. RS. P.	Iruttu-pallam. RS. P.	Parapatti. RS. P.	Southern slopes. RS. P.	Sholakarai. RS. P.
	Name of bamboo series.					
1950–51	915 00	7,005 00	5,085 00	450 00	3,750 00	2,368 00
1951–52	2,200 00	10,490 00	13,761 00	515 00	3,067 00	5,649 00
1952–53	3,015 00	9,015 00	1,265 00	..	4,005 00	2,999 00
1953–54	1,300 00	1,157 00	1,800 00	460 00	..	..
1954–55	1,200 00	1,700 00	1,175 00	500 00	5,680 00	..
1955–56	4,025 00	15,660 00	1,175 00	..	2,945 00	2,820 00
1956–57	3,100 00	10,000 00	12,000 00	375 00	..	8,100 00
1957–58	7,350 00	12,525 00	6,050 00	325 00	4,127 00	5,305 00
1958–59	9,075 00	21,000 00	5,275 00	..	7,575 00	2,501 00
1959–60	5,110 00	4,005 00	12,045 00	..	..	..

N.B.—Parapatti, Southern slopes and Sholakkarai bamboo coupes were not put up for sale during 1959–60 as there were no bamboos to be removed after the gregarious flowering during 1957. All the dead bamboos were apparently removed during 1957–58 and 1958–59 (Southern slopes and Sholakkarai coupes only).

142. The prices obtained for minor forest produce during the period 1950–51 to 1959–60 are given below :—

1950–51.	1951–52.	1952–53.	1953–54.	1954–55.	1955–56.	1956–57.	1957–58.	1958–59.	1959–60.
RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.
21,436 50	3,756 00	3,300 00	3,581 41	7,107 81	10,908 52	24,486 50	6,050 69	20,002 13	20,154 59

143. The prevailing sale prices for different kinds of forest produce are given below :—

Sholakarai depot—

(i) Timber—

Teak (in round) .. .. .. Rs. 12·00 to Rs. 25·00 per c.ft.
Rosewood (in round) .. .. Rs. 10·00 to Rs. 40·00 per c.ft.
Miscellaneous timber (in round) .. Rs. 3·50 to Rs. 6·50 per c.ft.

(ii) Fuel—

Tamarind and *Vellanagai* fuel .. Rs. 45·00 to Rs. 50·00 per ton.
Miscellaneous fuel (in billets) .. Rs. 32·00 to Rs. 35·00 per ton.

(iii) Bamboos—

Bottom pieces 18 to 20 feet (5·49 to 6·09 metres) long and 18 to 24 inches (45·7 to 61·0 cms.) in girth (*Yettukolethattai*)—Rs. 62 to Rs. 70 per 100.
Bottom pieces 15 to 20 feet (4·57 to 6·09 metres) long and 18 to 24 inches (45·7 to 61·0 cms.) in girth (*Arukolethattai*)—Rs. 35·00 to Rs. 45·00 per 100.
Bottom pieces 12 to 14 feet (3·66 to 4·27 metres) long and 9 to 12 inches (22·9 to 30·5 cms.) in girth (*Aruvatheri*)—Rs. 20·00 to Rs. 25·00 per 100.
Bottom pieces 15 to 17 feet (4·57 to 5·18 metres) long and 12 to 15 inches (30·5 to 38·1 cms.) in girth (*Ambatheri*)—Rs. 35·00 to Rs. 45·00 per 100.
Bottom pieces 10 to 14 feet (3·05 to 4·27 metres) long and below 6 inches (15·2 cms.) in girth (*Nooreri*)—Rs. 15 to Rs. 20 per 100.

Splits (*Dabbai*)—Rs. 1·50 per bundle of 50 pieces.

Alandurai depot—

(i) Timber—

Rosewood (in round) .. .. .. Rs. 20·00 to Rs. 40·00 per c.ft.
Miscellaneous timber (in round) .. .. Rs. 4·50 to Rs. 7·00 per c.ft.
Plough shares (of *Karuvagai*) .. .. Rs. 2·50 per plough-share.

(ii) Fuel—

Tamarind and *Vellanagai* fuel (in billets). Rs. 50·00 per ton.
Miscellaneous fuel (in billets) .. .. Rs. 35·00 per ton.

(iii) Bamboos—

Bottom pieces 18 to 20 feet (5·49 to 6·09 metres) long and 18 to 24 inches (45·7 to 61·0 cms.) in girth (*Yettukolethattai*)—Rs. 65·00 to Rs. 70·00 per 100.
Bottom pieces 15 to 20 feet (4·57 to 6.09 metres) long and 18 to 24 inches (45·7 to 61·0 cms.) in girth (*Arukolethattai*)—Rs. 40·00 to Rs. 50·00 per 100.
Bottom pieces 12 to 14 feet (3·66 to 4·27 metres) long and 9 to 12 inches (22·9 to 30·5 cms.) in girth (*Aruvatheri*)—Rs. 20·00 to Rs. 22·00 per 100.
Bottom pieces 15 to 17 feet (4·57 to 5·18 metres) long and 12 to 15 inches (30·5 to 38·1 cms.) in girth (*Ambatheri*))—Rs. 40·00 to Rs. 50·00 per 100.

Coimbatore depots—

(i) Timber—

Teak scantlings—Rs. 25·00 to Rs. 30·00 per c.ft.

Rosewood scantlings—Rs. 20·00 to Rs. 23·00 per c.ft.

Pillamarudu scantlings—Rs. 9·00 to Rs. 10·00 per c.ft.

Junglewood scantlings—Rs. 5·00 to Rs. 7·00 per c.ft.

Teak planks—Rs. 40·00 to Rs. 45·00 per c.ft.

Rosewood planks—Rs. 35·00 to Rs. 40·00 per c.ft.

Junglewood planks—Rs. 4·00 to Rs. 7·50 per c.ft.

Teak reepers 2″ × 1″ (5·08 cms. × 2·54 cms.)—Rs. 150·00 per 1,000 running feet.

Junglewood reepers 2″ × 1″ (0·508 cms. × 2·54 cms.)—Rs. 45·00 per 1,000 running feet.

Kolmarams 6″ × 4″ × 15′ (15·0 cms. × 10·0 cms. × 6·1 metres) of miscellaneous species—Rs. 26 per *kolmaram*.

Kolmarams 6″ × 4″ × 15′ (15·0 cms. × 10·0 cms. × 4·57 metres) of miscellaneous species—Rs. 19·00 per *kolmaram*.

Spokes and felloes of teak—Rs. 70·00 per set.

(ii) Poles—

"Oosikal" teak poles 10 to 14 feet (3·05 to 4·27 metres) long and 6 to 8 inches (15·2 to 20·3 cms.) in girth—Rs. 75·00 per 100.

"Saram" teak poles 12 to 15 feet (3·66 to 4·57 metres) long and about 15 inches (37·5 cms.) in girth—Rs. 2·50 per pole.

"Medium" teak poles 15 to 18 feet (4·57 to 5·49 metres) long and about 18 inches (45·0 cms.) in girth—Rs. 5·00 per pole.

"Over" teak poles 18 to 20 feet (5·49 to 6·10 metres) long and about 24 inches (61·0 cms.) in girth—Rs. 7·50 per pole.

(iii) Fuel and charcoal—

Tamarind and *Vellanagai* fuel (in round billets)—Rs. 60·00 per ton.

Miscellaneous fuel (in round billets)—Rs. 40·00 per ton.

Tamarind and *Vellanagai* fuel (splitted)—Rs. 72·00 per ton.

Splitted miscellaneous fuel—Rs. 50·00 per ton.

Charcoal—Rs. 4·50 per bag.

(iv) Bamboos—

Bottom pieces 18 to 20 feet (5·49 to 6·09 metres) long and 18 to 24 inches (45·7 to 61·0 cms.) in girth (*Yettukolethattai*)—Rs. 75·00 to Rs. 85·00 per 100.

Bottom pieces 15 to 20 feet (4·57 to 5·49 metres) long and 18 to 24 inches (45.7 to 61.0 cms.) in girth (*Arukolethattai*)—Rs. 53·00 to 60·00 per 100.

Bottom pieces 12 to 14 feet (3·66 to 4·27 metres) long and 9 to 12 inches (22·9 to 30·5 cms.) in girth (*Aruvatheri*)—Rs. 25·00 to Rs. 28·00 per 100.

Bottom pieces 15 to 17 feet (4·57 to 5·18 metres) long and 12 to 15 inches (30·5 to 38·1 cms.) in girth (*Ambatheri*)—Rs. 55·00 to Rs. 60·00 per 100.

Top pieces 10 to 15 feet (3·05 to 4·57 metres) long and 3 to 6 inches (7·62 to 15·00 cms.) in girth (*Nathi*)—Rs. 1·25 to Rs. 20·00 per bundle of 20 pieces.

Splits (*Dabbai*) of 3′ × 1½″ × ½″ (0·91 metres × 3·75 cms. × 1·245 cms.) for textile supply—Rs. 3·50 per 100.

CHAPTER IV—STAFF AND LABOUR SUPPLY.

SECTION 1—STAFF.

144. The present staff of the range consists of :—

1 Range Officer.
2 Range Clerks.
1 Range Peon.
4 Section Foresters.
12 Forest Guards and 1 special duty Forest Guard for Koochimalai beat.
12 Reserve Watchers.

145. In addition, 1 Forester for teak plantations, 1 Forester for softwood plantations, and 5 special duty Forest Guards are employed for the planting works under Development plans.

SECTION 2—LABOUR SUPPLY.

146. There is no dearth of unskilled labour even in the agricultural season. Such labour is engaged on ordinary forest work such as regeneration, fire-line and coupe-line clearings, cultural operations and road repairs. The labour is drawn from the neighbouring villages and from the various tribal (Irular and Muduvar) settlements in the reserved forests themselves.

147. For felling, conversion, and dragging of timber, labour from Malabar who are more adept in this work, have to be requisitioned. A number of sawyers from Malabar (who are usually employed during the fair weather for sleeper operations in the adjacent Muthikulam forests in Kerala) have settled down in the village of Alandurai and are available whenever required.

148. Skilled labour like carpenters, masons and stone-cutters who are required for building and road works are available locally. The Boyans, a backward caste from Gobichettipalayam taluk who are well known for their adeptness in building construction form the majority of the masons.

149. *Hill tribes*.—The two main hill tribes in the range are the Irulars and the Muduvars. There is little to differentiate between them, either in their physical appearance or their methods of living except that the dialects spoken by them are rather different.

150. Both Irulars and Muduvars are moderately dark with short square bodies, thick lips and crinkled hair. The Irulars consider themselves superior to the Muduvars, do not dine with the latter nor do they intermarry. The two tribes live in separate settlements, in groups of 3 or more families in small thatched huts in settlements or 'pathys' as they call them, around which they do cultivation of hill paddy, ragi, cholam and other dry crops. With the land proving infertile after a few years, they would move to new areas thus practising shifting cultivation.

151. In order to settle them permanently and to put an end to the practice of shifting cultivation, they have been allotted lands inside the reserved forest which they cultivate under an annual lease as tenants at will of the Forest Department. There are 8 such ' pathys ' at present. The main conditions of the lease are :—

(1) The lands are enjoyed free of rent.

(2) Any alienation of the leased area is prohibited.

(3) The lessees shall assist the Forest Department as mazdoors, on payment of wages in such forest works as they may be called on to do.

(4) They shall, on requisition, construct huts for Officers of Government halting in or near their village, free of charge and will carry such officers' samans to the next halting place for a wage of two annas (12 Paise) for half a day and 4 annas (25 Paise) for a full day. This condition is practically dead now as there are very limited possibilities of camping in tents in the rather limited shola forests of the present Bolampatti Range after the transfer of the Attapadi Block VI forests to Kerala State.

(5) They may cut and remove third class timber from the leased area for their own use and collect and use minor forest produce for themselves.

(6) Free grazing is allowed for a specified number of cattle.

(7) They shall act as forest police within specified limits and shall put out any fires inside it.

152. The statement given below exhibits the latest census of the various settlements inside the reserved forests, the extent of land set apart for each, and the number of cattle allowed to graze free.

Serial number and name of the settlement.	*Area in acres (hectares).*	*Number of families.*	*Total number of members.*				*Number of cattle allowed for grazing.*		
			Men.	*Women.*	*Children below 18 years.*	*Total.*	*Cows and bulls.*	*Buffaloes.*	*Sheep.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			I. IRULARS.						
1 Singapathy	58·75 (23·77)	24	29	27	16	72	37	5	15
2 Jaghirporathy east and west	21·75 (8·79)	18	18	20	5	43	*	..	—
3 Sircarporathy ..	14·82 (6·00)	12	12	14	4	30	*	—	—
4 Vellapathy	20·00 (8·09)	11	12	11	7	30	13	4	6
5 Sadivayal	36·87 (14·92)	15	15	18	16	49	*	—	—
6 Boddapathy	24·00 (9·71)	4	6	5	4	15	6	..	—
7 Melapathy (Attukal pallam)	22·40 (9·06)	12	14	12	5	31	*	..	—
			II. MUDUVARS.						
8 Kalkothipathy ..	18·50 (7·49)	9	12	11	9	32	13	3	14

* Represents settlements in which cattle are maintained, but unfortunately free permits do not seem to have been issued in the Range Office. The particulars are therefore not available.

153. Each 'pathy' or settlement has its own headman or 'Moopan' whose decision is always considered final in matters of petty dispute among themselves, and is their general spokesman to the outside public and officers of the Government.

154. Both Irulars and Muduvars are adept in honey collection as most hill-tribes are, and are even now the only people employed for this purpose. In other works like clearing of coupe or inspection lines, fireline works, weedings and other cultural operations in plantations involving the use of the bill-hook, they are still largely employed, although, they are often lazy and do not do a full day's work. They are useless in respect of felling and conversion of trees and other types of more strenuous work.

155. The Irulars and Muduvars were allowed to do *Kumri* cultivation in all the older plantations of the range, but of late they seem to ignore this concession presumably because they are able to find employment in the agricultural fields adjacent to the reserves where they get more attractive wages. The Irulars at Melapathy and Marudamalai for instance are employed mostly in the local agricultural fields.

156. Of late, a number of amenities have been afforded to them by the Harijan Welfare Department in the form of *pucca* buildings at Singapathy and Kallar, and schools at Thanneerpandal and Adivaram, but their condition is still very backward and needs amelioration particularly in respect of medical facilities which are very primitive in the whole of the Bolampatti Valley.

157. *Wages.*—The following statements are details of wages paid to skilled and unskilled labour in the Bolampatti Range during the year 1959–60 :—

(a) Skilled labour.

Man.	Woman.	Boy.	Reserve Watcher.
RS. P.	RS. P.	RS. P.	RS. P.
1 25 per day.	0 75 per day.	0 63 per day.	13 00 per mensem.

(b) Unskilled labour.

Mason, I class.	Mason, II class.	Carpenter, I class.	Carpenter, II class.	Sawyers.
RS. P.	RS. P.	RS. P.	RS. P.	RS. P.
4 00 per day.	3 00 per day.	4 00 per day.	3 50 per day.	3 00 per day.

Blasting mazdoor.	Stone cutter, I class.	Stone cutter, II class.
2·50 per day.	20·00 for 100 cft.	12·00 for 100 cft.

(1 C. foot = ·028 C. metres.)

158. These rates are fixed by the Conservator of Forests in the Forest Schedule of Rates annually in accordance with prevailing local conditions, and are subject to revision every year. There have been no appreciable changes in the wages during the past few years.

CHAPTER V—PAST SYSTEMS OF MANAGEMENT.

SECTION 1—GENERAL HISTORY OF THE FORESTS.

(a) Early History and Reservation.

159. The Bolampatti Blocks I, II and III Reserved Forests were first notified under section 16 of the Madras Forest Act in the year 1884.

160. The Thenkaradu Block was taken up by the Jungle Conservancy Department in 1868, and notified under section 16 of the Forest Act in 1884.

161. The Sholakarai Block was formed in 1868 partly from Government lands, an area of 380 acres (121.41 hectares) having been acquired for Rs. 2,000 and added. The block was notified under section 16 of the Forest Act in 1885. Both the Thenkaradu and Sholakarai Blocks were added on to the Bolampatti Block I Reserved Forest and the combined area renotified later in 1913.

162. The '81 acre piece' of 'Small Sholakarai' was surveyed in 1868, but was notified under section 16 of the Forest Act only in 1889.

163. Bolampatti Blocks I, II and III are said to have been worked under the permit system from 1884 to 1902. The fellings were evidently scattered and very unsystematic. At the time of construction of the South Indian Railway, some large timber appears to have been extracted from the southern slopes of Bolampatti Block I, presumably for sleepers. Apart from this, nothing further is known about the early history of these forests.

(b) Introduction of working plans (1902 to date).

164. The first attempts to regulate fellings were made by Porter in 1887 in the Bolampatti Block II Reserved Forest and portions of the Bolampatti Block I Reserved Forest lying in the Bolampatti Valley, but the first working plan was written by Gass in 1896 and sanctioned in 1898.

165. In 1902, this plan was revised by Foulkes. This plan included prescriptions for the Bolampatti Block III Reserved Forest also for the first time, but it was never worked and was eventually cancelled in 1919. It would appear that, in general, Gass's working plan was followed from 1896 to 1915–16, subject to some modifications.

166. The first working plan for the Walayar Valley was written by Foulkes in 1902, which included the Sholakarai Block, parts of Thenkaradu, the Konamalai Hills and the Sankarayapuram Reserved Forest since disreserved. Foulkes' plans expired in 1921, but their prescriptions were ordered to be continued till 1926 for the Walayar Valley.

167. These early plans provided for working the fuel forests only.

168. In 1915, Chengappa prepared a scheme for working bamboos in the Bolampatti Valley.

169. In 1926, Hicks prepared a revised working plan for the Walayar Valley for a period of 10 years (1926–35). The same year Mahoney was asked to prepare a plan for the Bolampatti Blocks I and II. But Mahoney was transferred to Ganjam soon after the field work was over, and hence the writing up of Part I of the plan was done by Coode during his recess in 1926. Part II of the plan was written by Wimbush, Conservator of Forests, Working Plans Circle. This plan was also for a ten-year period from 1926–35. The Bolampatti Block III Reserved Forest was without a working plan until 1930, when M. H. Krishnaswami prepared a fresh plan (1930–39) for this reserve as well as the whole of the forests in the Thadagam Valley. All the three plans continued to operate until 1937 when they were revised by T. V. Venkateswara Ayyar.

170. T. V. Venkateswara Ayyar wrote two working plans, one in 1932 for the Ghat forests of the Palghat Forest Division (1933–34 to 1942–43) which covered only an area of 2,558 acres (1,035.20 hectares) of evergreen forests in the present Bolampatti Range considered suitable for selection working. The second plan for the Walayar, Bolampatti and Thadagam Valleys covering most of the forests of the present Bolampatti Range came into operation in 1937. Both these plans were for a period of 10 years, but C. J. Van Haeften who was appointed as Working Plans Officer in 1942 to revise the Ghat Forests working plan of T. V. Venkateswara Ayyar eventually prepared a consolidated working plan for the entire Palghat Forest Division for the first time for a 15-year period which expired during 1958–59. Owing to the fact that the bulk of the forests of the division were transferred to the Kerala State in 1956 on account of 'States' Reorganisation', the revision of Van Haeften's plan was not taken up in due time. Consequently, his prescriptions were extended, although most of the working circles had been subject to several amendments.

(c) Administrative history of the range.

171. The forests in the Bolampatti and Thadagam valleys soon after reservation were constituted as the Bolampatti Range under the District Forest Officer, Coimbatore South Forest Division while the forests in the Walayar Valley were included in the Palghat Range under the District Forest Officer, South Malabar Division to start with. In 1905–06, the Palghat Range was also transferred to the District Forest Officer, Coimbatore South. In 1910, when the forest charges in the Coimbatore district were divided into four, the forests of the Bolampatti and Thadagam Valleys were included in

the Coimbatore Central Forest Division, while the Walayar Valley forests remained in the Coimbatore South Forest Division. In 1918, the Attapadi Block VI Reserved Forest (now in Kerala State) was also transferred to the Bolampatti Range.

172. In 1921, the Palghat Forest Division was formed and the Bolampatti and Palghat Ranges were included as part of it. With the introduction of the Ghat forest working plan of T. V. Venkateswara Ayyar in 1932, the forests of the Navakkarai Section were transferred to the Bolampatti Range and those of Attapadi Block VI to Palghat Range. This arrangement resulted in keeping the entire forests of Palghat division located in the Coimbatore district within the Bolampatti Range, and the Malabar forests in Palghat Range. However, in 1950, the Navakkarai forests were again seceded and included in the Palghat Range and the Attapadi Block VI Reserve Forest transferred to the Bolampatti Range.

173. With the advent of " States' Reorganisation " in 1956, and the necessity to keep to the Revenue District boundaries, the Attapadi Block VI Reserved Forest was re-transferred to the Palghat Range and the Navakkarai forests were transferred back to the Bolampatti Range and the range itself was included in Coimbatore North Forest Division. In 1958, the range was transferred to Coimbatore South Forest Division for administrative convenience. In 1959, a further reorganisation took place. The Thadagam Valley Forests were transferred to the newly constituted Perianaickenpalayam Range in the Coimbatore North Forest Division. The Bolampatti Range as at present consists only of the forests in the Bolampatti Valley and the Walayar Valley forests lying east of the Walayar River. In 1961, the range became part of the newly constituted Coimbatore Central Division.

SECTION 2—PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS.

174. *General.*—The forests in the Walayar and Bolampatti Valleys have been divided into a number of blocks based on well-known local names and further sub-divided into compartments during Venkateswara Ayyar's revision of the plans of Hicks, Wimbush and M. H. Krishnaswami. These divisions have been continued by Van Haeften who has again sub-divided several compartments into sub-compartments wherever more intensive work was prescribed. However, no compartment boundaries have been maintained in the field. No compartment histories have been maintained either for any of the compartments thereby defeating the very purpose of forming compartments.

175. The past systems of management and their results are briefly described below :—

(a) *Fuel forests.*

176. The earliest working plans, that of *Gass* for the Bolampatti Valley (1898–1915–16) and that of *Foulkes* for the Walayar Valley (1902–26) prescribed the working of the fuel forests under ' Coppice with standards ' with a rotation of 20 years for the coppice. The forests thus worked consisted of areas in the plains and the lower slopes containing very little of timber. The system was not successful as ' Coppice with standards ' was not the method most suited for producing the largest quantity of fuel-wood. There were no timber species fit to be retained as standards, with the result that the standards left were but few and bamboo, *Lantana*, etc., got a firmer hold each time the coppice was cut, to the detriment of the coppice re-growth. The system was apparently a failure, since after two rotations of working, it became the exception to find anything approaching ' Coppice with standards '. The system of working was changed to ' Simple coppice ' under the orders of the Chief Conservator of Forests, in the Bolampatti Valley in 1919–20 and in the Walayar Valley in 1923–24.

177. The working plans of Hicks (1926–37) for the Walayar Valley and that of Wimbush (1926–37) for the Bolampatti Valley brought the fuel forests under three working circles. (1) The Pole Working Circle, (2) The Ponam Working Circle, and (3) the Fuel Working Circle or Coppice Working Circle.

178. The Pole Working Circle included parts of the Navakkarai Section in the Walayar Valley in which 'simple coppice' was prescribed assisted by artificial regeneration of blanks with teak at an escapement of 9 feet by 9 feet (2.74 metres by 2.74 metres) with a 30 year rotation. The fellings were generally carried out according to programme, but no evidence of any artificial regeneration work remained. Apparently these were confined only to portions west of the Walayar River (now in Kerala State) which constituted a major portion of this working circle.

179. The Ponam Working Circle consisted of the best fuel forests, where coupes averaging 28 acres (11.33 hectares) were to be clear-felled annually and regenerated with teak and other species like *Karumarudu*, *Karuvagai*, *Vagai*, *Vengai*, Neem, Rosewood and *Kumil*. An area of 332 acres (134.36 hectares) was thus regenerated between 1926 and 1935. The attempts at regenerating teak were not successful for reasons explained elsewhere.

180. The rest of the fuel forests consisting of all the less fertile areas considered not suitable for any artificial regeneration were included in a Coppice Working Circle for the Bolampatti Valley and a Fuel Working Circle for the Walayar Valley with almost the same prescriptions with a view to supply firewood and poles of miscellaneous species to the Coimbatore market. The Silvicultural System adopted was 'Simple coppice' on a 20-year rotation. Cleanings were prescribed, but with no artificial regeneration. Only one series was constituted in the Walayar Valley which included parts of the Sholakarai Block. In the Bolampatti Valley, 3 series were formed, viz., (*a*) The Singapathy series, (*b*) The Mullangadu series, and (*c*) The Kalar Series.

181. *M. H. Krishnaswami's plan* (1930–31) for the Bolampatti Block III Reserved Forest included the fuel forests in this reserved forest under 2 fuel series in a Coppice Working Circle, the prescriptions of which were the same as that of Wimbush's Coppice Working Circle. Only 1 series—The Ichikuli Series was constituted in this reserved forest.

182. *T. V. Venkateswara Ayyar* (1937–45) brought the fuel forests under two working circles—(1) The Pole Working Circle and (2) The Fuel Working Circle.

183. The Pole Working Circle had the same object of management as the earlier plans, included the same areas in the Sholakarai and Waterfall Blocks and made practically the same prescriptions except that the rotation was increased from 20 to 40 years. The fellings were carried out generally as per programme, but no plantations were raised (in the areas now remaining in Madras) during this plan period also. The areas coppiced received little attention in respect of any cultural operations.

184. The Fuel Working Circle included all the rest of the workable fuel forests in the plains and lower slopes in the Walayar and the Bolampatti Valley excepting those areas considered suitable for teak planting. Ten series—(1) Thenkaradu, (2) Iruttupallam, (3) Singapathy, (4) Mullangadu, (5) Kallar, (6) Ichikuli, (7) Chavadi, (8) Mathipalayam, (9) Mangalapalayam and (10) Marudamalai were constituted. The silvicultural system prescribed was the same in the previous working plans—'Simple coppice', and the rotation was maintained at 30 years. The coppice was to be supplemented artificially by 'rab' or 'ponam'. The sale and felling of coupes was generally satisfactory, but the regeneration work prescribed was not carried out scrupulously, chiefly for want of people to do the work. Where artificial regeneration has been done, the success is varying. Unfortunately, however, the *Cassia siamea* raised with the other species has grown more

vigorously than the rest, the black cotton soil of the locality evidently being best suited for it. It is a matter for consideration whether the resulting growth is any better than the coppice shoots that would have otherwise occupied these areas.

185. *C. J. Van Haeften* (1944–45 to 1958–59) treated the fuel forests under two working circles. The Fuel Working Circle areas of T. V. Venkateswara Ayyar that were considered fertile enough for being supplemented by artificial regeneration were included in a Fuel Plantation Working Circle while the less fertile areas considered not suitable for artificial regeneration and the areas previously included under the Pole Working Circle were brought under a Fuel Working Circle.

186. Two felling series were constituted in the Fuel Plantation Working Circle—(1) The Singapathi series and (2) The Casuarina Felling Series. For both the series no coupes were laid out, but the annual area of the coupe and the sequence in which the compartments were to be worked was specified, but the District Forest Officer was given the discretion to select the annual area anywhere within the compartment.

187. The Singapathy Felling Series extended over 1,550 acres (627.26 hectares) over portions of the old Singapathy and Mullangadu Fuel Series and portions of the Kallar Fuel Series considered unsuitable for the raising of teak; but fertile enough for the raising of ordinary fuel species. Most of these areas consisted of the old *Cassia siamea* plantations which were prescribed to be clearfelled and regenerated on a 30 year rotation with or without *Ponam* or *Kumri* with indigenous species yielding good fuel like *Karungali* (*Acacia sundra*), *Velvelam*, *Parambai*, *Unjal*, *Vagai*, *Karuvagai*, Neem, *Vellanagai*, *Porasu*, *Vengai*, *Karuvelam* (*Acacia arabica*) and *Tamarind*. To this long list, two more species *Konapuliyan* (*Pithecolobium dulce*) and *Seemai Vannai* (*Prosopis julieflora*) were ordered to be included in 1946 by the Chief Conservator of Forests. Sowings were prescribed to be done along lines 22 feet (6.71 metres apart) and 2 feet. 61 metres (approximately) wide along the contour and ploughed in at the centre to form a continuous furrow 6 inches (15.24 centimetres) deep.

188. The Casuarina Felling Series extended over a small area of 150 acres (60.70 hectares) in the Sadivayal Block. Artificial regeneration of Casuarina with an espacement of 7 feet by 7 feet (2.13 metres by 2.13 metres) on a 10 year rotation was prescribed on an experimental measure to start with, but to be continued as a regular work later on if found successful.

189. Only 1 acre (0.41 hectare) of Casuarina plantation was raised in 1945. In 1946, the Casuarina Felling Series was scrapped, as the scheme was unsuccessful and difficulties in watering were experienced. The areas allotted to the Casuarina Felling Series were allotted to the Singapathy Series. There is no semblance of any Casuarina plantation anywhere at present. In the same year, an area of 2,212 acres (855 hectares) marked for teak planting in the Conversion Working Circle was transferred to the Fuel Plantation Working Circle, thereby swelling its area. The newly added areas were constituted to form 3 Series—(1). The Walayar Series with an area of 11,682 acres (672.59 hectares) falling partly in the Sholakarai Block and partly in the Walayar Reserved Forest (since transferred to the Kerala State), (2) The Vellapathy Series with an area of 692 acres (280.04 hectares), and (3) The Kalkothipathy Series with an area of 788 acres (318.90 hectares). The fellings were carried out generally as per programme until 1953. The discretion given to the District Forest Officer to select the areas was rather unfortunate and resulted in unsystematic working. Added to this, no control records seem to have been maintained. It is difficult to assess the results of past working. Artificial regeneration is said to have been done in Mullangadu, Kallar and Mangalapalayam in a patchy and irregular way but not with much success. Sissoo, *Albizzia* and *Acacias* were the chief species tried.

190. In 1953, all fuel planting was put an end to and a new scheme to introduce softwoods in the Fuel Plantation Working Circle areas was drawn up for utilising the funds provided under the Five-Year Development Plans. Nine bits in Kallar, Singapathy, Mullangadu and Mangalapalayam beats forming in all an area of 349.95 acres (141.61 hectares) were accordingly clearfelled and planted with softwards during 1954. From then onwards, softwards like *Ailanthus excelsa* and *Salmalia malabarica* were introduced on a scale of 200 acres (80.90 hectares) annually in compact blocks in the Mullangadu beat. The details of softwood planting and its results are analysed separately.

191. Since 200 acres (80.94 hectares) were being felled annually for conversion into softwoods in areas overlapping the Singapathy Fuel Plantation Series, it was not considered economical to work the fuel plantation series in the Bolampatti Valley also separately. Hence, both the Kalkothipathy and Singapathy Fuel Plantation Series were stopped from working in 1955. The Walayar Series had to be closed down in 1956 owing to 'States Reorganisation', as the remaining coupes to be worked fell in the areas transferred to Kerala State.

192. The prescriptions of the Fuel Working Circle were the same as that of T. V. Venkateswara Ayyar except that no artificial regeneration was prescribed. The rotation was maintained at 30 years, but no coupes were laid out on the map as in the Fuel Plantation Working Circle. Instead, the annual area and the sequence in which the compartments were to be worked alone were specified and the District Forest Officer was given full discretion to select the annual coupe anywhere within the compartment as it was felt there might not be yearly demand for all the coupes. Tamarind and Sandal were to be retained as reserved trees. Eight Series were constituted in the present Bolampatti Range, viz. :—(1) Thenkaradu, (2) Chavadi, (3) Mangalapalayam, (4) Iruttupallam, (5) Poondi, (6) Kallar, (7) Ichikuli and (8) Marudamalai. The Marudamalai series was prescribed to be felled free of charge by the Irulars of Marudamalai and utilised for their domestic use. This scheme apparently did not work and was soon closed down. The details are not known as no control maps or records have been maintained for this series.

193. The discretion to the District Forest Officer to select the annual coupe led to unsystematic working. Several of the series were over-worked and as no further areas were available for working they had to be closed down even before the term of the working plan had expired. Thus the Chavadi and Iruttupallam Series were closed down in 1951, and the Ichikuli Series in 1953.

194. Adding to this, the working circle underwent a series of amendments. In 1952, the Government as a state-wide policy ordered that all trees of Neem, *Salmalia malabarica*, (*Calophyllum inophyllum*) and Soapnut (*Sapindus emarginatus*) were to be left unfelled in all fuel coupes as it was considered that these species were more useful for their minor forest produce than fuel. In 1953, V. V. Subramaniam, I.C.S., the then Chief Conservator of Forests ordered that slopes steeper than 1 in 3 need not be worked, with the result, no coupes were sold during 1954 as they fall in steep country. This resulted in the Mangalapalayam Series being closed down in 1954. In 1954, this order was revoked by the Chief Conservator of Forests but it was ordered by the Conservator of Forests, Ootacamund Circle, that compartments with an expected fuel yield of below 4 tons (4.06 metric tonnes) per acre need not be put up for sale. This resulted in the Poondy and Kallar Series not being worked. Large areas of these two series were also utilised for conversion into softwood plantations referred to elsewhere, in detail. A further amendment was issued in 1956, when it was felt that the existing areas of the coupes were too small, and hence coupes of adjacent series were ordered to be clubbed and put together for sale. It is not known where and how this was achieved, in the absence of any control records.

195. With the cessation of the working plan in 1958, no fuel working was done except in the Thenkaradu Series where one coupe is being laid out year after year.

(b) *Teak Plantations.*

196. The earliest teak plantation in the Bolampatti Range is said to have been raised in the year 1908–10 on an experimental scale by dibbling teak seeds over an area of 2.5 acres (1.01 hectares) near Sadivayal. But there are no records in this connection.

197. A ring counting of two trees (felled in this plantation for purposes of stem analysis while preparing this plan) revealed that the age was 50 to 51 years thereby lending authenticity to the local information.

198. As the results of this plantation were encouraging, Wimbush prescribed the artificial regeneration of teak and fuel species along with field crops by Irulars in suitable areas of felled fuel coupes.

199. Several species were tried in the beginning, but teak, *Vengai* (*Pterocarpus marsupium*), *Karuvagai* (*Albizzia odoratissima*) and *Karumarudu* (*Terminalia tomentosa*) were decided upon finally.

200. The planting was done until 1930, in bunds 12 feet (3.66 metres) apart and 4 feet (1.22 metres) apart within the bunds. From 1931, the bunds were dispensed with, and a planting espacement of 9″ x 9″ (2·74 metres x 2·74 metres) was adopted. The planting and sowing were to be completed in the first week of June. The earlier plantations were all raised by sowing seeds. In 1933, sowing was abandoned and the method of stump planting was introduced for the first time.

201. The *ponamdars* usually raised two field crops in the year. An area of 332 acres (134.36 hectares) was thus regenerated between 1927 and 1937. The attempts at raising teak were not successful, due probably to inadequate attention given to the planted areas coupled with the difficulty of meeting the varied silvicultural requirements of mixed crops of the different species introduced. As usual, more hardy and fast growing species took the field to the exclusion of teak. *T. V. Venkateswara Ayyar* in his working plan (1937–1945) grouped all the areas fit for growing teak in the Bolampatti Valley under a Ponam Working Circle constituting 2 series :—(1) The Vellapathy Series and (2) the Kalkothipathy series. The object of management was to replace the existing natural forests of miscellaneous species with even aged crops of teak in localities suitable for it, and in the poorer drained areas with *Karumarudu* (*Terminalia tomentosa*) and *Vengai* (*Pterocarpus marsupium*) on a 40 year rotation by the *Ponam* or *kumri* method. Stump planting was prescribed for all the 3 species with an espacement of 6′ × 6′ (1.83 metres × 1.83 metres). In the Vellapathy Series, the fellings and planting work were generally carried out as per programme, whereas in the Kalkothy series, the 1st coupe was felled only in 1938 and regenerated in 1939. The teak plantations raised in both the series have come up quite well. The miscellaneous plantations had only a patchy success; barring *Karumarudu*, the rest mostly failed.

202. *Van Haeften* (1945–1958) replaced the Ponam Working Circle of T. V. Venkateswara Ayyar by his Conversion Working Circle. The prescriptions were the same as in the previous plan, except for the fact that *Karumarudu* (*Terminalia tomentosa*) alone was prescribed for planting in marshy areas instead of a host of species as done hitherto. Van Haeften, apparently impressed by the sucess of teak planting during Venkateswara Ayyar's plan period, added on all the suitable areas in the Bolampatti Valley to swell the area of his Conversion Working Circle. An area of 3,155 acres (1,276.80 hectares) forming part of the Sholakarai, Waterfall, Iruttupallam, Singapathy and Sadivayal Blocks were included in the Bolampatti Valley. Three series were constituted : (1) The Vellapathy series, (2) the Kalkothipathy series and (3) the Walayar series. The last named series consisted of mostly areas in the Walayar Reserved Forest (since transferred to Kerala State) but included an area of 882 acres (356·93 hectares) in the Sholakarai and Waterfall Blocks.

An area of 31 acres (12·54 hectares) in the Vellapathy series, 28 acres (11·33 hectares) in the Kalkothipathy series, and 84 acres (34·00 hectares) in the Walayar series were prescribed to be felled annually.

203. The felling and planting programmes were carried out with gusto and with uniform success until 1946. Since the average site quality of the plantations raised so far was low, in 1946 it was considered not economic to spend large amounts in raising teak plantations on low site quality areas, when extensive tracts of better site quality areas were available in Nilambur and Wynaad. Hence, further planting was ordered to be stopped. The unfelled areas earmarked for teak forming an area of 2,438 acres (986.63 hectares) were then transferred to the Fuel Plantation Working Circle. This was a rather unfortunate decision, since this range now happens to be one of the few ranges in the reorganised Madras State with areas suitable for teak planting. The plantations had they been raised would have proved invaluable to-day. The plantations raised so far have proved a success, and the intermediate yields from thinnings alone have more than repaid the initial costs of planting.

204. Teak planting was again revived in 1957 at Sadivayal under the Second Five-Year Development Plan. The plantations raised have been quite good.

205. A statement of all the teak plantations in the range with their respective areas as they exist at present is given in Appendix IV.

206. The results achieved so far clearly promise success for teak planting in the Bolampatti Valley provided suitable sites are chosen. The valley is blessed with a rainfall of about 150 centimetres in the plains received from both the monsoons, and the soil is fairly deep wherever the slopes are gentle. As the soil tends to be clayey, drainage appears to be the only limiting factor.

(c) *Evergreen Timber Working—Selection Working Circle.*

207. The earliest attempts to work the limited evergreen forests in the range were made by *T. V. Venkateswara Ayyar.* In his plan for the Ghat Forests of Palghat (1932–44) an area of 2,558 acres (1,035.20 hectares) on the Varadimalai plateau of Bolampatti Block II Reserved Forest were clubbed along with the Attapadi Block VI Reserved Forest (now in Kerala State) to form a single series called the Attapadi Series under a Selection Working Circle. The objects of management were to exploit the sholas for merchantable timber—chiefly, *Nangu* (*Mesua ferrea*), *Pali* (*Palaquium ellipticum*) and *Kattupinnai* (*Calophyllum elatum*)—in such a manner that their essentially evergreen character is not endangered, and to so treat them as to improve the proportion of merchantable species they contain. Two distinct quality classes were recognised for *Mesua*, the first quality found in associations below approximately 3,750 feet (1,143 metres) and the second one, in those above this elevation, and distinctly poorer, in height and girth than the first.

208. Selection fellings on a rotation of 150 years with varying felling cycles were prescribed. As these forests were not worked previously, the growing stock consisted of a large proportion of mature, over mature and partly hollow trees, it was decided to remove them on a shorter felling cycle of 13 years for the first felling cycle keeping the exploitable girth as high as 7′ 6″ (2.29 metres) for *Nangu* (*Mesua ferrea*) of 1st quality, Rosewood (*Dalbergia latifolia*), Teak and *Vengai* (*Pterocarpus marsupium*), and 6′ 6″ (1.98 metres) for *Nangu* (*Mesua ferrea*) of 2nd quality. Venkateswara Ayyar surmised that in the second felling cycle, the trees would be of smaller average girth, be more sound, and a larger percentage of the stand would be available for felling. Hence for the second felling cycle the exploitable girth was reduced to 6′ 6″ for all species, on a felling cycle of 15 years.

209. The major part of the working circle being shola, the yield was so regulated as to obtain an approximately equal annual output of railway sleepers, no allowance being made for any increment during the first felling cycle as many of the trees were already moribund or deteriorating. Volume and out-turn tables were accordingly prepared for *Nangu* (*Mesua ferrea*) of Q.I, from outturn figures obtained during past working. As no figures were available for *Mesua* of II quality and for the other species, it was estimated that the out-turn from II Quality *Mesua ferrea* was three-fourths of that of the first quality. Teak, Vengai (*Pterocarpus marsupium*) and Rosewood (*Dalbergia latifolia*) were taken as equivalent to second quality *Mesua* as they constituted a small number presuming that this supposition is not likely to affect the results appreciably. The coupes thus constituted were not of equal extent, but approximately equi-productive with reference to the yield of Railway sleepers. For the second felling cycle the increment was prescribed to be taken into consideration. Since no increment plots were laid out for *Mesua* anywhere in the division, Troup's figures for *Mesua ferrea* in the Nambor forests of Assam were used as a basis for calculation. For Teak, Rosewood (*Dalbergia latifolia*) and *Vengai* (*Pterocarpus marsupium*) no data on natural trees being available, the increment was taken as the same for II Quality *Mesua*.

210. The rotation was fixed at 150 years. Gap regeneration with useful indigenous shola species and *Senkurunji* (*Gluta travancorica*) from Tirunelveli was prescribed in the gaps caused by fellings. Tending of natural regeneration over 1/10th of the annual coupe was prescribed so as to benefit the more valuable local species.

211. Since the demand for sleepers suddenly fell in 1932, the prescriptions of the Selection Working Circle were held in abeyance till 1935. Later too, owing to a slump in the timber market, the demand for species other than *Mesua* fell off considerably, and hence *Mesua* alone was worked, for which even the annual out-turn in sleepers was below the estimated possibility.

212. Gap regeneration having proved elsewhere, a technical as well as administrative failure, was given up in 1937. Owing to lack of sufficient knowledge about the shade requirements of the different species introduced, or for some other reason, the work was not a success, in spite of the money spent on it. Similarly, tending of natural regeneration was rather indefinitely carried out. The areas tended were never re-visited, and consequently no checks on the operations were made. No details of the amounts spent on these different works are now available either.

213. *Van Haeften* continued the prescriptions of Venkateswara Ayyar with not many changes. The same areas formed part of the working circle. No quality classification was recognised for *Mesua* or any of the other species; but the exploitable girth was reduced to 6 feet (1.83 metres) for *Mesua* and to 6′ 6″ (1.98 metres) for the other species. The rotation was retained at 150 years, and the felling cycle at 15 years. As the coupe system of Venkateswara Ayyar did not prove successful owing to the uncertainty of the demand and the irregular nature of the forests, definite areas were not allotted to definite years of work. Instead, only the sequence in which the compartments were to be worked and the maximum number of *Mesua* trees to be felled were prescribed. The yield was so regulated, that the sum total of all trees in the 20 to 22 inches (50 to 55 centimetres) diameter class at the begining of the previous felling circle plus 25 per cent of the trees still left unfelled in the diameter classes above this were to be taken into account for purposes of felling. The following reasons were attributed for fixing a percentage as low as 25 per cent for removal :—

(1) Many of the trees left in these classes were overmature and hollow.

(2) *Mesua* was not evenly distributed but in groups and with the marking rules in force, it was considered impossible to fell all the trees.

214. For the remaining species no regulation of the yield was made, except that the felling should be conformed to the usual marking rules.

215. No artificial regeneration was prescribed owing to the failure of similar methods during the previous plan, but instead a tending of natural regeneration of valuable species over 1/15th of the area of the working circle annually was prescribed.

216. Owing to definite areas not being allotted every year, this working circle had the same defects as the other working circles. The working tended to be unsystematic. The extraction seems to have been confined to *Mesua* alone as there was apparently little demand for the other species during these years apart from the prohibitive cost of extraction in the rugged terrain. The exact areas which were worked are not known as no control journals or extraction maps are available either with the District Forest Officer or the Range Officer as prescribed. It is learnt from information gathered from old subordinates of the range that only one compartment in Poondy beat was worked for sleepers. The tending was apparently not quite successful as the areas are on very steep terrain at an average elevation of 4,000 feet (1.219 metres) and not susceptible for easy check.

(d) *Management of Bamboo Forests.*

217. The earliest systematic working of bamboos in the Bolampatti Valley seems to have been done as per the prescriptions of a scheme written by K. A. Chengappa in 1915. The areas affected were those that had recently flowered or expected to flower shortly. No other details of the scheme or its working are now available.

218. *Kalmungil* (*Dendrocalamus strictus*) flowered gregariously between 1924–32 in the Bolampatti Valley. *Wimbush* (1926–1937) while writing his plan in 1925, foreseeing this included all the bamboo areas in the valley in a Bamboo Working Circle and divided them into 3 coupes on a 3 year 'rotation' as termed by him apparently meaning felling cycle. From 1929 onwards, one coupe was prescribed for working each year. Flowering of bamboos also did take place in the Walayar valley at the same time. *Perumungil* (*Bambusa arundinacea*) flowered in the Waterfall Block in 1930, and *Kalmungil* (*Dendrocalamus strictus*) flowered in the Sholakarai and Thenkaradu Blocks in 1931 and 1932.

219. Hicks (1926–1937) in his plan for the Walayar Valley therefore included all these areas in a Bamboo Working Circle dividing them into 2 felling series, the boundaries of which corresponded to his Pole and Fuel Working Circles respectively. Each felling series in turn was divided into 3 coupes, one of which was to be worked annually on a 3 year felling cycle. The coupes were leased out regularly as prescribed.

220. *T. V. Venkateswara Ayyar* (1937–44) covered all the bamboo areas of the range and divided them into 6 felling series as follows :—(1) Savakad, (2) Sadivayal, (3) Iruttupallam, (4) Southern slopes, (5) Sholakarai and (6) Parapatti. A felling cycle of 3 years was adopted, and to this end all the series were divided into 3 annual coupes except the Parapatti Series which was divided into two coupes only, as the area available was so limited that its subdivision into three coupes was likely to result in the coupes being too small and therefore insufficient to provide work for the Parapatti Irulars all through the year. It was also prescribed that Iruttupallam Coupe I, will be worked in the years in which either coupe I or coupe II of the Parapatti Series is not due for working, so as to afford continuous work for the Irulars. The 81 acres (32.77 hectares) Small Sholakarai Reserve Forest consisting of a good stock of *Kalmungil* (*Dendrocalamus strictus*) was prescribed to be worked departmentally, so as to serve as a demonstration area for the bamboo contractors. The working of the bamboo coupes was carried out according to the programme as a rule.

221. *Van Haeften* (1944–1958) continued the same areas with the same prescriptions with practically no changes, except for the amalgamation of the Small Sholakarai Forest in the Sholakarai Series, as the experiment prescribed in this reserved forest in the previous plan had served its purpose.

222. The working of the bamboo coupes has been generally carried out as per programme. Extraction of immature culms, leaving the top ends and unwanted pieces in the culm itself resulting in congestion has effected considerably the production of new culms. Added to this, large areas forming part of the Sadivayal Series were clear-felled and planted with softwoods under the Second Five-Year Plan Scheme. This progressive dimunition of the size of the coupes resulted in a steep fall in the prices fetched (from Rs. 21,000 in 1958–59 to Rs. 4,005 in 1959–60), while at the same time not bettering the condition of the forest as the softwood plantations are not quite successful. No efforts were also made to substitute the areas lost from the Bamboo Working Circle by planting up fresh areas with bamboos.

(e) *Minor Forest Produce.*

223. The chief minor forest produce in the range are Honey, Wax, *Shekoy*, *Avaram*, Tamarind, *Peypodal*, etc. Since the introduction of regular working plans, all the minor forest produce are farmed annually, the right of collection being leased out every year.

224. The more important minor forest produce like Tamarind, *Avaram*, *Peypodal* and quarry stone are leased out as separate units. All the other minor forest produce are sold together as one unit. Since 1956, the demand for *Peypodal* has suddenly fallen off and so it is included along with the other minor forest produce. The right to collect *Avaram* bark in the reserves and unreserves of the range is sold annually, with the receipts shared by both the Forest Department and the District Board.

(f) *Grazing.*

225. From the time of reservation, all the forests of the range were opened to grazing excepting the Sholakarai Block which was closed till 1924. The cutting of grass was however always allowed.

226. Since the introduction of regular working plans in 1926, grazing was permitted throughout the range except in worked coupes and regeneration areas for a period of 5 years, subject to a limit of 5 acres (2.02 hectares) per cow-unit. Grazing of all animals except goats were permitted. Cattle of the Sholakarai, Thenkaradu and Waterfall blocks were subjected to enhanced rates of grazing, the rates being :

	RS.	P.
Per head—		
Buffaloes ...	2	00
Cow ...	1	00
Sheep ...	0	50

227. For the remaining areas, the general rates prevalent at that time were adopted, the rates being :—

	RS.	P.
Per head—		
Buffaloes ...	1	00
Cows and Bulls ...	0	50
Sheep ...	0	25

228. Penning of cows but not of buffaloes and sheep within the forest was permitted between the months of July and December in all areas except those included in the Coppice and Ponam Working Circles. The fee to be paid for penning was fixed at Rs. 2.50 per 100 cattle. Irulars in the forests were allowed to graze their cattle free subject to a limit fixed at the discretion of the District Forest Officer. In order to cover their grazing, free permits were issued by the Range Officer.

229. During Venkateswara Ayyar's plan period, the same prescriptions were continued. Attempts to demonstrate the advantages of rotational grazing to the public were made in the Marudamalai Block with no tangible result.

230. In 1938, the Government as a State-wide policy permitted the cutting and removal of fodder grass in head-loads by the ryots for bona fide domestic use from all the reserved forests of the State. In 1950, the grazing rates were made uniform all over the range as uniform grazing rates for indigenous cattle were prescribed by the Government all over the State. The present rates of grazing are as follows :

Per head--	RS. P.
Buffaloes	0 50
Cows, asses and horses	0 20
Sheep	0 12
Elephants	1 00

231. Enhanced grazing rates are now levied only for the Ettimadai ex-panchayat forests. These rates were fixed when these forests were under panchayat management and the same have been continued even after the reversion of these forests to departmental control. The rates levied are :—

Per head--	RS. P.
Buffaloes	2 00
Cows and bulls	1 00
Sheep	0 50

232. The enhanced rates are justifiable as these forests are denuded and the major source of revenue from these forests is through grazing which is necessary for maintenance of the existing protection staff.

(g) Protection working circle.

233. Areas not included in the other working circles have been allotted to this working circle in all the working plans. These areas consist of mostly high level sholas on precipitious slopes and deciduous forests considered unexploitable because of their remoteness and the comparatively valueless crop. No silvicultural operations were prescribed in this working circle except for grazing and penning of cattle, collection of bamboo and minor forest produce.

(h) Fire protection.

234. *Walayar valley.*—The first fire traces were cut in 1870 in the present Sholakarai Block. In 1878, four inspection lines dividing the block into four compartments were cut and used as fire traces. The Thenkaradu Block was fire traced in 1873. Organized fire protection, however, appears to have commenced only with the year 1880.

235. *Hicks* was in doubt about the advisability of fire protecting the plains portions, except areas recently regenerated. He prescribed only the maintenance of fire lines on both sides of the railway; and none other in the plains. The hill slopes were prescribed to be protected by burning annually the fire lines on the crest and at the foot of the hills.

236. A system of fire patrols was maintained for 4 months during the fire season. The results of the system were generally found to be satisfactory.

237. The same prescriptions were continued during the plan periods of *T. V. Venkateswara Ayyar* and *C. J. Van Haeften*.

238. *The Bolampatti valley*.—The forests of the Bolampatti valley were first protected against fires by means of fire lines at the foot of the hills, and by fire patrols. The annual expenditure on fire protection ranged between Rs. 45 and Rs. 1,508 between 1916 and 1925.

239. *Wimbush* (1926–35) prescribed the continuance of the system then prevailing fixing a total allotment of Rs. 800 per annum for fire protection.

240. In addition to the prescriptions of Wimbush outlined in the paragraph above, the Chief Conservator of Forests ordered the fire tracing of the district boundary between Malabar and Coimbatore, the upper limits of the fuel series along a given contour, boundaries of all coupes, five year old and less of the Fuel and Ponam Working Circles, and the pilgrim path to Vellingiri temple. The system was generally found to be effective.

241. *T. V. Venkateswara Ayyar's revised plan* (1937–1944).—This plan prescribed the continuance of the fire protection measures laid down by Wimbush and in addition the fire tracing of additional lines so as to make good the breaks in the line following the foot-hills. Fire tracing the lines around the Poondi and Vellingiri Temple enclosures was also prescribed. Venkateswara Ayyar also prescribed that fire tracing of *ponam* areas alone need be done, and that of fuel coupe boundaries need not be done.

242. There was no change in the prescriptions of Van Haeften to that of Venkateswara Ayyar.

243. In 1956, the Chief Conservator of Forests ordered that no general fire protection need be done all over the State as a measure of economy. Accordingly, from 1956 onwards the following fire protection measures alone were prescribed to be carried out in both the valleys :—

(1) Fire tracing around all plantations three years old and below.

(2) Fire tracing around all buildings and timber depots inside reserved forests. These lines should not only be burnt but swept clear at intervals throughout the fire season.

(3) Fire tracing on either side of the railway line passing through the Sholakarai Block.

(4) Fire tracing the lines around Poondy and Vellingiri temple enclosures and the bridle paths leading to it.

(5) Maintenance of fire patrols during the fire season.

244. In spite of all these measures, the incidence of fires in the deciduous forests are practically the same year after year, particularly in the Koochimalai beat.

(i) *Ex-Panchayat Forests.*

245. In 1918, a portion of Bolampatti Block I Reserved Forest at its eastern end was handed over to panchayat management for 3 years in charge of two boards one at Madukarai and another at Ettimadai. Since the panchayat management was bad, in 1925, these boards were superseded and the areas taken over by the Revenue Department. An area of 2,426 acres (981.78 hectares) was then placed under the management of a regular panchayat of elected members from Madukarai, Ettimadai and Sundakamuthur. The details of management under the panchayat regime are rather obscure, but there was no doubt that the forests were heavily exploited, overgrazed and subjected to large scale goat browsing, for when they reverted to the Forest department (on panchayat abolition) in 1948, they were in a hopelessly denuded condition, including several encroachments.

246. In an attempt to rehabilitate these forests, artificial regeneration was carried out from 1953 onwards, in selected areas termed " Conservator's Plots ", under the orders of the then Chief Conservator of Forests. Sissoo, *Albizzias* and *Acacias* were the chief species tried. The same area was regenerated apparently during 1954 and 1955 also, but with patchy success. As the species chosen earlier had failed in 1955, Neem and *Kodaivelam* (*Acacia planifrons*) alone were planted but with the same results. Otherwise, in these newly acquired ex-panchayat forests mere protection alone has brought about good results.

Section 3—Special works of improvement undertaken.

247. *Grass experiments.*—Venkateswara Ayyar prescribed experiments to be conducted (in Marudamalai) in fenced sample plots in close co-operation with the Agricultural Chemist. *Kolukattai grass* (*Cenchrus ciliaris*) a species of good fodder value was experimented with, as follows :—

(1) One acre (·40 hectare) to be effectively fenced with tight-lock fencing to serve as the control plot. Representative collections of all ground flora appearing over the plot were to be made at intervals of three months beginning with 1st July, and forwarded to the Agricultural Chemist, Coimbatore, for identification and analysis.

(2) A second acre (·40 hectare) to be fenced in the same manner in an adjoining plot but two heads of cattle were to be allowed to graze inside the plot for a period of three months. The grazing was to be from 1st July to 30th September during the first year, 1st of October to the end of December in the 2nd year, 1st of January to the end of March in the 3rd year, and the 1st of April to the end of June in the 4th year. Representative collections of the ground flora were to be made as in plot I and identified by the Agricultural Chemist.

(3) A third acre (·40 hectare) was to be fenced in similar manner adjoining plots 1 and 2, and treated in the same manner as plot II. The ground flora over the plot was prescribed to be burnt in the month of April or as soon as it had seeded and dried up, whichever was earlier. No grazing was allowed till the 1st of July or till it is normally due, whichever was later. Representative collections of the ground flora were to be made as in other cases, identified and analysed.

248. ***Results.***—The experiments were laid out during September 1937 at a total expenditure of Rs. 410–0–9. Periodical collections of grass samples in flower were made every three months, for identification and chemical analysis. The identification revealed that the following grasses were represented in all the three plots :—

(1) ***Cholapullu*** (*Chrysopogon montanus*).

(2) ***Oosipullu*** (*Heteropogon contortus*).

(3) ***Seranaipullu*** (*Eragrostis bifaria*).

(4) ***Chinnakoraipullu*** (*Bothriochloa pertusa*).

(5) ***Kura itti*** (*Sehima nervosum*).

(6) *Apluda aristata.*

(7) ***Puliampullu*** (*Brachiaria ramosa*).

(8) ***Eulalia phaeothrix.***

(9) ***Panicum suveglume.***

249. The chemical analysis showed that the samples from all the three plots were of average mineral composition in the first year, whereas in the first half of the second year a slight increase in proteins and phosphorous pentoxide was seen in the samples from plot III which is closed to grazing. No data could be collected during the second year from plot I which is the control plot as it was accidentally burnt by the Section Forester

while early burning an adjacent area. All the subsequent results showed that in every analysis conducted there was a slight increase in the quality of protein, lime and phosphorous pentoxide contents over the results obtained in the previous quarter. This slight increase was progressively maintained, but the increase was not found to be significant even in the 10th sample taken in January 1940. The experiment was called off in January 1940 as being inconclusive. No efforts were therefore made to propagate artificial fodder grass species in the Marudamalai forests.

250. *Experiments on teak.*—The 1925–26 fuel coupe in Kalkothipathy which was worked under simple coppice was handed over to the Provincial Silviculturist to enable him to determine the best and cheapest way of raising a new crop in a clear-felled area covered with *Lantana* and climbers. In a part of this area, teak and other species were planted at 12 feet by 12 feet (3.66 metres by 3.66 metres) in 1926 under the *ponam* method. Casualties were replaced in 1937. In 1928, teak seeds were dibbled in between the teak lines. This teak has come up very well and the rate of growth is very promising. The plantation was thinned in 1942. Other species did not fare so well. A certain amount of sandal is also found in this locality. A climber cutting was done in this plantation in 1949–50.

251. *Planting of sandal.*—Sandalwood seeds have been dibbled by students of the Madras Forest College at Singapathy, Vellapathy and Sadivayal. The exact year of survey is not known. The planted sandal has spread itself naturally in the adjoining areas and forms a valuable improvement to the composition of the existing growing stock. Some of the trees are 18 to 24 inches (45 to 60 cms.) in girth.

252. *Planting of Mahogany.*—Mahogany (*Swietenia macrophylla*) has been planted near the Sengalpallam well in the Sholakarai Block, near the subordinates' quarters of Vellapathy and near the Poondy temple. The exact years of planting are not known. The planted Mahogany has come up well, although natural regeneration is scarce. The Mahogany at Sengalpallam was felled in 1955.

253. *Planting of teak and hardwoods in felled fuel coupes.*—Two isolated attempts to plant teak and other hardwoods in felled fuel coupes outside working plan prescriptions were made in 1955 and 1956 under the instructions of E. A. Lasrado, Conservator of Forests, Ootacamund Circle, purely with the idea of increasing the proportion of valuable species in the fuel series for the next rotation, although the resultant coppice was considered to be quite adequate to fill up the area.

254. During 1955, an area of 27.75 acres (11.62 hectares) in the Small Sholakarai Reserved Forest forming bit II of Thenkaradu Fuel Coupe No. XXX felled in 1954 was planted with teak at an espacement of 18 feet by 18 feet (5.49 metres by 5.49 metres) after clearing the jungle growth, but without interfering with the coppice shoots and bamboo clumps. The details of expenditure incurred are not known now, as the regeneration ledgers have not been maintained properly. The plantation was a failure in the first year itself owing to lack of rain immediately after the planting was completed, the unsuitability of the pronounced black cotton soil of the area for teak and heavy weed growth which was not properly tended.

255. In 1956, a similar work was ordered to be taken up by the Conservator of Forests as part of the Second Five-Year Plan which had just then been ushered. The planting area was increased to 45.2 acres (18.30 hectares) and the espacement to 8½ feet by 8½ feet (2.59 metres by 2.59 metres). An area of 20.0 acres (8.09 hectares) in the last strip of Walayar Fuel Coupe No. XXIX and an area of 25.2 acres (10.19 hectares) forming the first strip of Walayar Fuel Coupe No. XXX lying adjacent to each other were chosen. The planting was ordered to be done after burning in patches without disturbing the standards of tamarind (*Tamarindus indica*) and Poola (*Salmalia malabarica*), and bamboo clumps. The area was planted in May-June 1956 at a total cost of

Rs. 693-6-0. Unfortunately, the whole area could not be planted with teak for want of teak stumps, as the work was ordered to be taken up suddenly and no nursery had been maintained. Three acres (1.21 hectares) were therefore planted with *Dalbergia sissoo*, but at this species failed, the whole area was replanted with teak. The planted teak has come up quite well in spite of the black cotton soil, but the lack of proper tending and weedings has greatly inhibited the growth of this plantation.

256. *Extension of teak plantations under the Second Five-Year Plan.*—In 1957, the Chief Conservator of Forests ordered the planting of teak at a rate of 50 acres (20.23 hectares) annually in the Bolampatti Range under the Second Five-Year Plan Scheme, titled 'Expansion of planting activities of valuable commercial timbers'. An area of 38 acres (15.38 hectares) was accordingly selected in Sadivayal close to the Chinnar, and an area of 12 acres (4.86 hectares) in Sholakarai adjacent to the 1956 hardwood plantation, to make a total of 50 acres (20.23 hectares). The planting at Sadivayal was completed during June 1957 at a cost of Rs. 575 and the area given for *ponam* cultivation. This plantation has come up exceedingly well. The well drained deep soil, the proximity of the area to the river, and timely planting have all contributed to the success of the plantation.

257. The area of 12 acres (4·86 hectares) planted in Sholakarai has been a complete failure. No details of the work done or the expenditure incurred are not available now as no regeneration ledger has been maintained for this work.

258. The planting of teak was continued at Sadivayal during the years 1958, 1959 and 1960 at an average rate of 50 acres (20.23 hectares) annually, but unfortunately the areas selected were partly swampy, and so the plantation failed in parts. The swampy areas of the 1958 plantation were restocked with *Karumarudu* (*Terminalia tomentosa*) and that of the 1959 plantation with *Eucalyptus* hybrid, *Vengai* (*Pterocarpus marsupium*) and Rosewood (*Dalbergia latifolia*). None of the species have come well.

259. The total area thus planted with teak and other hardwoods under the Second Five-Year Plan Scheme is 197 acres (79.72 hectares), the details of which are given in Appendix IV.

260. *Conservator's plots.*—From 1953 onwards, efforts were made from time to time to plant up sparsely stocked areas in low rainfall areas with indigenous as well as exotic fuel species under the general instructions of V. V. Subramanian, I.C.S., the then Chief Conservator of Forests, in small selected areas which were ostensibly referred to as Conservator's plots. Special attention was prescribed to be given to the regeneration areas.

261. The first Conservator's plot was raised in 1953 over an area of 4.70 acres (1.90 hectares) in the Sholakarai Block in Thenkaradu Fuel Coupe No. XXVIII felled during 1954. Sowings of *Seemai Vanni* (*Prosopis julieflora*) were done during the south-west monsoon in 2 feet (0.61 metres) wide lines cut 33 feet (10.06 metres) apart. In addition to this, pot plants of *Vengai* (*Pterocarpus marsupium*) and Rosewood (*Dalbergia latifolia*) were planted at an interval of 33 feet (10.06 metres) within the lines to make an espacement of 33 feet by 33 feet (10.6 metres by 10.6 metres). The total cost incurred was Rs. 121.75. Some of the *Prosopis* lines have come up fairly well, but the other species have failed completely. The planting of *Prosopis* in a felled coupe in an area blessed with 120 centimetres of rainfall was a mistake as the resultant coppice would have normally developed into a good fuel forest had it been left alone.

262. Basket plants of cashew were put in the area during 1955 under the orders of the Conservator incurring an expenditure of Rs. 59·87 but not one of them survived as the

black cotton soil of the area was undoubtedly inhospitable to the species. Not convinced with the outcome of the results, dibbling of cashew was done again in 1956 under the instructions of the Conservator at a cost of Rs. 7·50 with the same results.

263. Another Conservator's plot was raised during 1953 over an area of 30 acres (12.14 hectares) at Mullangadu in the Sadivayal Block. Sowings of seeds of tamarind (*Tamarindus indica*), *Parambai* (*Acacia ferruginea*), *Neem* (*Azadirachta indica*) and *Unjal* (*Albizzia amara*) were done in 3 feet (0.91 metre) wide lines cut 33 feet (10.06 metres) apart. This area receives a rainfall of nearly 125 centimetres and the plantation has come up quite well. The cost of raising the plantation is not known as the details are not recorded in the plantation journal.

264. A Conservator's plot is also said to have been raised during 1953 at Madukarai in the Ettimadai ex-panchayat forests over an area of 100 acres (40.47 hectares). Fuel species such as *Seemai Vanni* (*Prosopis julieflora*), *Sissoo* (*Dalbergia sissoo*), Neem (*Azadirachta indica*) *and Parambai* (*Acacia ferruginea*) seem to have been tried but the details of the technique adopted or the expenditure incurred are not known as no plantation journal has ever been maintained. The plot was a failure and the same area was apparently restocked during 1954 and 1955 with the same results. In 1956, the Conservator ordered that Neem and *Kodaivelam* (*Acacia planifrons*) may be tried, but the plot was still a failure. A few lines of stunted *Seemai Vanni* (*Prosopis julie flora*) near Madukarai is all that remains of the efforts made at regeneration.

265. *Soil conservation plots in the Marudumalai Block.*—An area of 50 acres (20.23 hectares) was regenerated annually during the years 1954, 1955 and 1956 at Chinnamalai in the Marudamalai Block utilizing the funds provided under the First Five-Year Plan. Discontinuous contour trenches 11 feet (3.35 metres) long, with a width of $1\frac{1}{2}$ feet (0.45 metre) at the top, 1 foot (0.31 metre) at the bottom, and 1 foot (0.31 metre) deep, alternating with uncut ground of 11 feet (3.35 metres) length, in lines 22 feet (6.71 metres) apart were dug and seeds of *Manjakonnai* (*Cassia siamea*), *Seemai Vanni* (*Prosopis julieflora*), *Konapuliyan* (*Pithecolobium dulce*) were sown on the mounds of earth heaped on the low hill side of the trenches. Pot plants of Cashew (*Anacardium occidentale*), *Kodaivelam* (*Acacia planifrons*) and *Sissoo* (*Dalbergia sissoo*) were put in 2 feet (0.61 metre) deep pits dug in the centre of each mound. Except for an area of 10 acres (4.05 hectares) near Marudamalai stocked with *Manjakonnai* (*Cassia siamea*) and another area of about 25 acres (10·11 hectares) around the Bhadrakaliamman Koil near Chinnamalai stocked with *Sissoo*, the rest of the area has completely failed. A few isolated cashew saplings are seen near the temple.

266. The details of expenditure incurred are not known as they have not been recorded in the regeneration ledgers maintained.

267. *Softwood plantations.*—The creation of softwood plantations is one of the special works undertaken in the Bolampatti Reserves during the past decade. This work had not been covered by any working plan.

268. With the rapidly diminishing stocks of matchwood timber in the natural forests of the country, and the need to keep the match industry going, the Government of India offered to subsidise 50 per cent of the cost of matchwood planting under the First Five-Year Plan as a sort of stimulus to the States. With this incentive, the Government of Madras in 1953, ordered the planting of matchwood on a large scale in areas wherever suitable to help the match industry from going to a standstill. The flattish and undulating country at the western end of the Bolampatti Valley forming part of the old Fuel Plantation Working Circle was considered suitable for this purpose as it is blessed with a fairly deep and well drained soil and an equitable rainfall from both the monsoons. Accordingly, four bits in Kallar, one bit in Mullangadu, two bits at Singapathy and two bits at Mangalapalayam forming in all an area of 349·95 acres (141·61 hectares) were clear-felled in 1953.

of which an area of 295.50 acres (119.90 hectares) was considered suitable for planting. Due to want of nursery raised material, seeds of *Pimaram* (*Ailanthus excelsa*) and *Salmalia malabarica* were sown in July 1954 in pits dug at an espacement of 22 feet by 11 feet (6.71 metres by 3.35 metres). The sowing was done at the rate of 3 lines of *Ailanthus*, and one line of *Salmialia*. The sowings proved to be a failure as they were done apparently late in July, after which very little rains were received from the south-west monsoon. The entire area was therefore replanted with basket plants and naked transplants of *Ailanthus excelsa* and *Salmalia malabarica* during the north-east monsoon No regular procedure was adopted in the mixture of species due to want of sufficient number of transplants, and the plants were put as and when they were made available from the local nurseries and from the surrounding ranges. In general, more of *Ailanthus* than *Salmalia* was put. Even then, the number of transplants fell short of requirements and a portion of the area was planted with basket plants of cashew at an espacement of 33 feet by 33 feet (10.06 metres by 10.06 metres). The planting was extended to 1955 also, when an area of 174.20 acres (70.50 hectares) in three bits was planted at Mullangadu. *Ponam* cultivation was allowed during both the years. In none of the plots have the softwoods been quite successful, and cashew failed more or less completely, the black cotton soil of the Bolampatti Valley proving totally unsuitable for the species.

269. In 1956, with the commencement of the Second Five-Year Plan, a scheme was drawn by E.A. Lasrado, Conservator of Forests, Ootacamund Circle, to plant up annually an area of 200 acres (80·94 hectares) in the Singapathy and Sadivayal Blocks during the plan period. *Ailanthus excelsa* and *Salmalia malabarca* were prescribed to be planted at alternate stakes at an espacement of 22 feet by 11 feet (6.71 metres by 3.35 metres) in conjunction with *ponam* cultivation. The planting was commenced in 1956 and an area of 200 acres (80.94 hectares) was planted annually. *Ailanthus* and *Salmalia* were planted in mixture to start with, but in 1959, *Salmalia* was planted pure as it showed to be the more promising of the two species. In 1960, teak was put in the centre of the quincunx of 12 feet by 12 feet (3.36 metres by 3.66 metres) of *Salmalia* plants with the idea that the softwoods could be cut down in favour of teak if found unsuccessful on a later date or *vice versa*. Unfortunately enough, this idea although theoretically laudable, did not succeed, as the teak planting was delayed until late in July 1960, for want of stumps and 90 per cent of the teak died.

270. The espacement was kept at 22 feet by 11 feet (6.71 metres by 3.35 metres) to start with, but was changed to 15 feet by 15 feet (4.57 metres by 4.57 metres) in 1957 and finally to 12 feet by 12 feet (3.66 metres by 3.66 metres) in 1959, as the planting lines were not found to close even in the oldest plantation then 5 years old, owing to the poor height growth exhibited by the plants.

271. In all an area of 1,502.7 acres (608.12 hectares) has been planted with softwoods in the range up-to-date, a list of which is given in Appendix III. Except for a few bits, the overall results are not encouraging as the height growth is poor and the stocking more often patchy and it is doubtful whether they would reach an exploitable size at an age of 20 years as was originally expected. The unsuitability of the site for softwoods, inadequate and undersized nursery raised stock, late planting and apparent lack of perfection in the planting technique adopted have all contributed to the softwood plantations being not quite successful. Teak which has a fool-proof technique which has been perfected after years of experimentation would have definitely fared better, as the rainfall is nearly 175 centimetres and the drainage good in most places.

272. From the above it will be seen that it would be more advisable to plant the areas earmarked for softwoods with teak instead. An area of 168 acres (67.79 hectares) which was under felling during 1960 at the time of preparation of this plan for conversion into softwoods will be therefore prescribed to be planted with teak during 1961–62.

273. *Roads, buildings and wells.*—Three separate statements are appended below exhibiting separately the roads and bridle paths, bridges, buildings, wells and rain-guages in the Bolampatti Range, with their capital cost, year of construction and other connected information :—

(a) List of roads, bridle paths, etc., in the Bolampatti Range.—

Serial number and name of the road or path. (1)	*Length.* (2) M.	F.	K.M.	*Capital cost.* (3) RS.	P.	*Year of construction.* (4)
1. Sengalpallam Road	1	0	(1·61)	Not known.		Not known.
2. Chinnar-Anayarkandy Road ..	3	0	(4·82)	600	00	Do.
3. Vellapathy Road	0	4	(0·81)	Not known.		Do.
4. Adivaram-Muthikulam Saddle Road.	5	5	(9·5)	164	30	1939–40.
5. Kalkothipathy Road	1	5	(2·62)	1,169	37	1940–41.
6. Konamalai Valley Road	0	6	(1·21)	540	00	1939–40.
7. Chavadipara Road	0	7	(1·41)	1,069	00	1929–30.
8. Kanavarai Estate connecting Narasapuram–Varadimalai Estate with Kuppudukal Serambi.	7	0	(11·27)	166	75	1941–42.

(b) Bridges—

Serial number and name of bridge. (1)	*Capital cost.* (2) RS.	P.	*Year of construction.* (3)
1. Bridge at mile 18/3-4 on the Chinnar–Anayarkandy Road.	539	12	1940
2. Bridge at 19th mile on the Chinnar–Anayarkandy Road.	1,519	25	194[illegible]

(c) List of Buildings.

Serial number and name of building. (1)	*Capital cost.* (2) RS.	P.	*Year of construction.* (3)	*Remarks.* (4)
1 Forest Guard's quarters at Navakkarai ..	389	00	1901–02	
2 Forester's quarters at Navakkarai ..	707	00	Do.	
3 Camping shed at Navakkarai	152	00	Do.	
4 Inspection shed at Sengalpallam	48	00	1893–94	Since dismantled.
5 Combined quarters for Forest Guard and Reserve Watcher at Madukarai.	6,289	43	1958–59	
6 Rest-house and garage at Iruttupallam ..	2,030	00	1887–88	
7 Range Officer's quarters at Iruttupallam.	1,544	00	1893–94	
8 Range Office at Iruttupallam	2,081	00	1913–14	
9 Range clerk-*cum*-Forester's quarters at Iruttupallam.	1,652	00	1917–18	
10 Forest Guard's quarters at Iruttupallam.	465	00	1892–93	Dismantled in 1949.
11 Forest Guard's quarters at Iruttupallam.	4,610	66	1949–50	
12 Forest Guard's quarters at Iruttupallam.	4,609	80	Do.	
13 Subordinates' quarters at Vellapathy ..	1,106	00	1913–14	
14 Subordinate's quarters at Poondy ..	1,024	00	1927–28	
15 Tanah shed at Thombilipalayam ..	16	00	1900–01	
16 Tanah shed at Pallapalayam	145	00	1896–97	Since handed over to the Revenue Department.
17 Tanah shed at Muniappankoil ..	34	00	1906–07	
18 Koil rest-house	549	00	1927–28	Dismantled in 1955.
19 Tanah shed at Periakulam (Ukkadam)	27	00	1896–97	Since handed over to Revenue Department.
20 Inspection shed at Kuppudukkal ..	616	15	1938–39	Dismantled in 1954.
21 Timber shed at Kuppudukkal	156	31	1940–41	Do.

NOTE.—The subordinates quarters' at Vellapathy and Poondi are not being occupied.

(*d*) *List of Wells.*

	Name and situation. (1)	*Cost of construction.* (2) RS. P.	*Year of construction.* (3)	*Remarks.* (4)
1	Well at Sengalpallam	200 00	Not known.	..
2	Well at Navakkarai Forest Colony.	200 00	Do.	..
3	Well at Iruttupallam Forest Colony.	230 00	Do.	..

(*e*) *List of Rain Guages.*

Serial number, name and location. (1)	*Cost of construction.* (2)	*Year of construction.* (3)	*Remarks.* (4)
Rain guage at Sengalpallam	Not known ..	Not known.	..

SECTION 4—ELEPHANT CAPTURING OPERATIONS.

274. It is understood that elephant capturing operations were undertaken in the Bolampatti Valley in the distant past but further details are not available.

275. The first regular prescriptions to capture elephants in the Bolampatti Valley as a profitable venture was made in Wimbush's Plan of 1926–35. The operations were conducted during 1930–31, when two tuskers fell but escaped, while 3 cows were captured and sold. Further work was suspended as it was found that it could not be a financial success so long as the *Kumki* elephants had no other work in the locality. The total expenditure on capturing operations was Rs. 781. The 3 cows together fetched Rs. 1,505.

276. Elephant capturing operations were never resumed later owing to the same reasons enunciated above.

SECTION 5—TIMBER TRANSIT RULES.

277. The necessity for controlling all major forest produce in transit in order to safeguard the Government forests has been felt particularly in the Bolampatti Range on account of the incessant exploitation of timber and fuel from extensive areas of privately owned forest in the adjoining Kerala State and from the Government forests in that State. This necessity was recognised when the range formed part of the then Coimbatore Central Forest Division and the Timber Transit Rules of Coimbatore Central District came into force in 1912. They were in force until the new rules for the Palghat Forest Division came into force on 22nd February 1932, under Notification No. 72 of that date and revised again under Notification No. 92, dated 30th January 1940.

278. Under the new rules, check stations were established at Navakkarai, Megamuniappan Koil and Iruttupallam.

279. Venkateswara Ayyar suggested the abolition of the check stations at Megamuniappankoil and Iruttupallam as the area of private forests in the Bolampatti valley is so negligible that there is very little scope for smuggling. Abolition of the check station at Navakkarai in the Walayar Valley was also suggested by him as it was considered that they helped little in protecting the State forests. These check stations accordingly stopped functioning since 1939. The position has changed following 'States Reorganisation' in 1956 as the Attapadi Block VI and the bulk of the forests in the Walayar Valley have now been transferred to the Kerala State. Large scale fellings are also in progress in the private forests of Kerala in the Walayar Valley since the enforcement of the Madras Preservation of Private Forests Act in 1949.

SECTION 6—PAST YIELD.

280. The following statement exhibits the yield from the Bolampatti Range for the period 1950–51 to 1959–60.

Year.	Timber in Cft. (c. metres).	Firewood.		Bamboos.				
		Billets in C.ft. (c. metres.)	*Faggotwood in C.ft. (c. metres.)*	*Large number.*	*Small number.*	*Split bundles.*	*Dead number.*	*Thorn bundles.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1950–51	7,679 (215·01)	5,17,628 (16,173.58)	1,25,729 (3,520·41)	1,26,533	3,12,254	..	64,900	..
1951–52	843 (23·61)	2,41,956 (6,774.77)	32,400 (907·20)	3,72,623	1,83,697	..	..	759
1952–53	7,004 (196·11)	2,79,201 (7,817.63)	..	1,24,071	2,99,244	..	..	..
1953–54	6,410 (179·48)	99,377 (2,762.56)	30,420 (851·76)	31,850	4,970	..	..	..
1954–55	458 (12·96)	6,541 (2,647.07)	2,272 (919·46)	40,273	5,274	..	..	..
1955–56	1,038 (29.06)	18,857 (528.00)	32,557 (911·60)	80,262	7,320	..	77,420	..
1956–57	6,877 (192.56)	1,51,910 (6,253.48)	72,757 (203·70)	5,35,285	1,03,511	1,53,067	8,99,130	5,853
1957–58	47,455 (132.87)	1,67,088 (4,678.46)	1,74,589 (4,888·49)	10,06,313	49,718	3,110	1,91,093	19,533
1958–59	12,355 (345.94)	3,00,450 (8,412·60)	..	7,25,309	72,525	8,15,519	14,86,088	..
1959–60	3,548 (99.34)	83,452 (1,336·66)	63,386 (1,914.81)	2,43,090	1,09,821	1,00,067	5,86,996	..

281. Practically all extraction having been done through the agency of contractors, these figures are based on their accounts only and can be therefore said to be only approximately correct. The yield from minor forest produce and bamboos is given in terms of money in paragraph 142.

SECTION 7—PAST REVENUE AND EXPENDITURE.

282. *Revenue.*—The following statement exhibits the net revenue from various items of forest produce in the Bolampatti Range, for the period 1950–51 to 1959–60 :—

Year.	*Sale of timber and fuel coupes.*		*Sale of bamboo coupes.*		*Sale of minor forest produce.*		*Grazing.*		*Other sources.*		*Total.*	
(1)	(2)		(3)		(4)		(5)		(6)		(7)	
	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.
1950–51 ..	98,830	35	37,696	69	21,436	50	3,327	75	3,487	65	1,64,778	94
1951–52 ..	14,047	00	17,450	00	3,756	00	3,727	31	7,118	37	73,098	68
1952–53 ..	96,826	32	6,857	00	3,300	19	3,437	12	4,291	03	1,14,711	66
1953–54 ..	74,425	51	15,822	75	3,581	42	3,193	25	2,996	66	1,00,019	59
1954–55 ..	5,161	76	19,258	56	7,107	81	3,293	50	3,247	35	38,068	98
1955–56 ..	28,426	17	23,380	00	10,908	52	3,648	25	1,338	51	67,701	45
1956–57 ..	2,30,637	28	4,011	00	24,486	31	4,271	12	3,145	40	2,66,551	11
1957–58 ..	1,59,158	77	58,717	34	6,050	69	4,585	40	1,175	00	2,29,687	20
1958–59 ..	90,265	17	19,777	09	20,002	13	3,900	50	2,976	56	1,36,921	45
1959–60 ..	1,13,597	64	21,115	00	20,154	69	4,382	00	4,182	34	1,63,431	67
Total ..	9,38,375	97	2,24,085	43	1,20,784	26	37,766	20	33,958	87	13,54,970	73
Average ..	93,837	60	22,408	54	12,708	43	3,776	62	3,395	89	1,35,497	07

283. *Expenditure.*—The following statement exhibits the net expenditure incurred in the Bolampatti Range during the period 1950–51 to 1959–60 :—

Year.	*Roads and buildings.*		*Re-generation.*		*Fire protection.*		*Establishment.*		*Miscellaneous.*		*Total.*	
(1)	(2)		(3)		(4)		(5)		(6)		(7)	
	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.
1950–51 ..	15,763	62	1,615	25	1,210	75	28,756	31	1,076	75	48,422	68
1951–52 ..	14,875	75	1,159	37	943	37	28,135	69	947	50	46,061	68
1952–53 ..	17,383	87	1,408	50	1,050	81	29,253	44	1,118	44	50,215	06
1953–54 ..	11,740	03	2,229	11	2,445	06	30,041	44	3,200	55	49,656	19
1954–55 ..	12,625	62	16,025	77	1,617	62	29,417	37	1,377	22	61,063	60
1955–56 ..	7,358	25	3,932	11	197	50	30,022	50	4,319	06	45,829	42
1956–57 ..	6,990	37	4,464	41	492	08	30,210	50	573	25	42,730	61
1957–58 ..	10,341	50	11,258	82	175	00	29,616	44	1,073	56	52,465	32
1958–59 ..	7,473	75	6,839	50	676	25	30,015	75	2,437	60	47,442	85
1959–60 ..	7,003	50	4,306	35	716	40	30,416	62	1,177	69	43,620	56
Total ..	1,11,556	26	53,239	19	9,524	84	2,95,886	06	17,301	62	4,87,507	97
Average ..	11,155	73	5,323	92	952	48	29,588	61	1,730	16	48,750	80

284. The above statement does not include proportionate share of charges relating to the District Forest Office.

285. The following statement shows the net surplus or deficit in the Bolampatti Range for the period 1950–51 to 1959–60.

Abstract of Revenue and Expenditure in the Bolampatti Range from 1950–51 *to* 1959–60.

Year. (1)		*Total revenue.* (2)		*Total expenditure.* (3)		*Surplus.* (4)		*Deficit.* (5)		*Remarks.* (6)
		RS.	P.	RS.	P.	RS.	P.	RS.	P.	
1950–51	..	1,64,778	94	48,422	68	1,16,356	26	..		
1951–52	..	73,098	68	46,061	68	27,037	00	..		
1952–53	..	1,14,711	66	50,215	06	64,496	60	..		
1953–54	..	1,00,019	59	49,656	19	50,363	40	..		
1954–55	..	38,068	98	61,063	60	..		22,994	62	The deficit was because several of the fuel coupes were not put up for sale during the year.
1955–56	..	67,701	45	45,829	42	21,872	03	..		
1956–57	..	2,66,551	11	42,730	61	2,23,820	50	..		
1957–58	..	2,29,687	20	52,465	32	1,77,221	88	..		
1958–59	..	1,36,921	45	47,442	85	89,478	60	..		
1959–60	..	1,63,431	67	43,620	56	1,19,811	11	..		

CHAPTER VI—STATISTICS OF GROWTH AND YIELD.

SECTION 1—STATISTICS COLLECTED PRIOR TO THIS PLAN.

286. Statistics collected in the past are but meagre regarding the rate of growth of timber species in the Bolampatti Range.

287. *Rate of growth of plantation teak.*—Venkateswara Ayyar carried out measurements of girth at breast height of teak plantations in the Bolampatti Valley while preparing his working plan (1935–37). Five sample plots, each one square chain in extent were measured in each plantation, the average girth for each plot was calculated and plotted on squarred paper, and an age-girth curve was drawn.

288. The sub-joined statement prepared from Venkateswara Ayyar's curve shows the girth over-bark at breast height for the ages shown against them.

Age in years. (1)	*Girth over-bark at breast height in inches (centimetres).* (2)
3	6·0 (15·24)
4	7·2 (18·29)
5	8·4 (21·37)
6	9·7 (24·64)
7	10·8 (27·43)
8	12·0 (30·48)

289. The data represent only a general average for the plantations then in existence, without any distinction of site qualities.

290. Based as it is on the very few plantations then in existence, this cannot be considered truely representative of the locality.

291. *Enumerations.*—Van Haeften carried out a cent-per-cent enumeration over an area of 1,829 acres (740.17 hectares) of deciduous forest in the upper slopes of the Bolampatti Valley lying in three discontiguous blocks. The enumeration procedure is not known. All trees of a breast height diameter of 12 inches (30.48 centimetres) and over belonging to certain species were enumerated in 4 inch diameter classes from 12 inches to over 40 inches.

292. The species enumerated were :—*Rosewood (Dalbergia latifolia), Teak (Tectona grandis), Vengai (Pterocarpus marsupium); Venteak (Lagerstroemia lanceolata), Pillamarudu (Terminalia paniculata)* and *Kadukkai (Terminalia chebula).*

293. The results were tabulated separately for each block. Briefly they are as follows :—

Statement showing the distribution of the growing stock in the three blocks enumerated in the Bolampatti valley.

Block I.

Reserve—Bolampatti Block II reserved forest.
Percentage of enumeration—100.

Gross area—996 acres (403·07 hectares).
Net area—683 acres (276·39 hectares).

	12″ to 16″ (30 48 to 40·64 *cms.*).	16″ to 20″ (40·64 to 50·80 *cms.*).	20″ to 22″ (50·80 to 55·88 *cms.*).	22″ to 24″ (55·88 to 60·96 *cms.*).	24″ to 28″ (60.96 71·12 *cms.*).	28″ to 32″ (71·12 to 81·28 *cms.*).	32″ to 36″ (81·28 to 91·44 *cms.*).	36″ to 40″ (91·44 to 101·60 *cms.*).	*Over* 40″ (101·60 *cms.*).	*Total.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Rosewood (*Dalbergia latifolia*) ..	1,547	793	271	176	127	60	18	12	15	3,019
Vengai (*Pterocarpus marsupium*) ..	206	183	87	72	78	64	26	22	54	792
Venteak (*Lagerstroemia lanceolata*).	400	277	104	74	79	40	17	11	6	1,008
Pillamarudu (*Terminalia paniculata*).	180	114	47	28	29	18	9	7	10	442

Block II.

Reserve—Bolampatti Block II reserved forest.
Percentage of enumeration—100.

Gross area—253 acres (102·38 hectares).
Net area—91 acres (36·82 hectares).

Rosewood (*Dalbergia latifolia*) ..	199	89	55	30	34	10	6	2	2	427
Vengai (*Pterocarpus marsupium*) ..	23	18	11	17	14	11	6	1	6	107
Venteak (*Lagerstroemia lanceolata*) ..	58	32	8	11	9	6	2	1	0	127
Pillamarudu (*Terminalia paniculata*).	31	37	20	12	13	6	4	2	17	142

Statement showing the distribution of the growing stock in the three blocks enumerated in the Bolampatti valley—cont.

Block III.

Reserve—Bolampatti Block I reserved forest.
Percentage of enumeration—100.

Gross area—580 acres (234-72 hectares).
Net area—358 acres (144·88 hectares).

	12" to 16" (30·48 to 40.64 *cms.*).	16" to 20" (40·64 to 50.80 *cms.*).	20" to 22" (50·80 to 55.88 *cms.*).	22" to 24" (55·88 to 60.96 *cms.*).	24" to 28" (69·93 to 71.12 *cms.*).	28" to 32" (71·12 to 81.28 *cms.*).	32" to 36" (81 28 to 91.44 *cms.*).	36" to 49" (91·44 to 101.60 *cms.*).	*Over* 40" (101·60 *cms.*).	*Total.*
Rosewood (*Dalbergia latifolia*) ..	460	178	53	43	22	14	3	3	2	778
Vengai (*Pterocarpus marsupium*) ..	63	69	43	30	39	47	43	29	47	410
Venteak (*Lagerstroemia lanceolata*) ..	155	85	39	30	20	14	10	4	6	363
Teak (*Tectona grandis*)	292	192	96	82	65	55	35	12	26	855
Pillamarudu (*Terminalia paniculata*).	148	103	54	24	40	26	9	7	11	422
Kadukkai (*Terminalia chebula*) ..	1	2	2	1	2	0	0	0	0	8

An abstract of the enumeration figures for all the three blocks showing the distribution of the growing stock under each species prepared from the above statement is given below.

Rosewood (*Dalbergia latifolia*) ..	2,206	1,060	379	249	183	84	27	17	19	4,224
Vengai (*Pterocarpus marsupium*) ..	292	270	141	119	131	122	75	52	107	1,309
Venteak (*Lagerstroemia lanceolata*) ..	613	394	151	115	108	60	29	16	12	1,498
Pillamarudu (*Terminalia paniculata*)	359	254	121	64	82	50	22	16	38	1,006
Teak (*Tectona grandis*)	292	192	96	82	65	55	35	12	26	855
Kadukkai (*Terminalia chebula*) ..	1	2	2	1	2	0	0	0	0	8

294. It will be observed that the enumeration did not record details of sound, partly sound and unsound trees in each diameter class.

295. The above figures show that the distribution of the diameter classes was not quite normal. The stocking in the lower diameter classes was generally poor. This was primarily due to inadequate regeneration.

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296. The areas enumerated constitute only 3·48 per cent of the total deciduous forests in the range considered suitable for selection working during the period of this plan; but in as much as these forests were never worked in the past, it was considered reliable to utilise this data without conducting a fresh enumeration in steep and rugged country which would be expensive and beyond the task of the small contingent of field staff of one Ranger and four inexperienced Foresters provided to the writer within the short period given for preparing this plan amidst the other works that had to be done. Presuming that the above data constituted a 30·48 per cent partial enumeration of the growing stock, the figures given below have been arrived at to correspond to the total growing stock in the two series constituted under the Selection Working Circle.

(a) *Kochimalai Selection Felling series.*

Reserve—Bolampatti Blocks I and II reserved forests.

Gross area—3,500 acres (1,416·41 hectares).
Net area—3,104 acres (1,256·16 hectares).

Rosewood (*Dalbergia latifolia*) ..	4,222	2,029	576	477	350	161	52	33	36	7,936
Vengai (*Pterocarpus marsupium*) ..	559	517	270	228	251	234	144	100	205	2,508
Venteak (*Lagerstroemia lanceolata*) ..	1,173	754	289	220	207	115	56	31	23	2,868
Pillamarudu (*Terminalia paniculata*).	687	436	232	123	157	96	42	31	73	1,927
Teak (*Tectona grandis*)	559	368	184	157	124	105	67	23	50	1,637
Kadukkai (*Terminalia chebula*) ..	2	4	4	2	4	0	0	0	0	16

(b) *Bolampatti Selection series.*

Reserve—Bolampatti Block II reserved forest.

Gross area—2,500 acres (1,011·72 hectares).
Net area—2,206 acres (892·75 hectares).

Rosewood (*Dalbergia latifolia*) ..	3,015	1,449	518	340	233	115	37	23	26	5,756
Vengai (*Pterocarpus marsupium*) ..	399	369	177	163	179	167	103	71	146	1,774
Venteak (*Lagerstroemia lanceolata*)..	838	539	206	175	148	82	40	22	16	2,066
Pillamarudu (*Terminalia paniculata*).	491	347	165	88	112	68	30	22	52	1,375
Teak (*Tectona grandis*) ..	399	262	131	112	89	75	48	16	35	1,167
Kadukkai (*Terminalia chebula*) ..	1	3	3	1	3	0	0	0	0	11

SECTION 2—STATISTICS COLLECTED FOR THIS PLAN.

297. (*a*) *Quality class mapping of teak plantations.*—All teak plantations of over 5 years age have been stock-mapped in order to assess the area to be alloted to the different All India Teak Site Quality Classes. The stock-mapping was done by the method briefly described below :—

298. A convenient base line was taken for each plantation and strips were cut at right angles to the base line at intervals of three chains. Each strip was then measured and pegged at each chain. The tallest tree in each square chain on either side of the strip was then measured thus securing the heights of the tallest tree in every square chain in two adjacent strips omitting one intermediate strip. The tallest tree in every tenth square chain of the intermediate strip was also measured, the fifth, fifteenth, twenty-fifth, etc., square being measured from one strip and the tenth, twentieth, thirtieth, etc., squares from the next strip and so on. Blanks, streams, inspection paths, swamps, failed patches and such other features were also marked while proceeding along each strip.

299. The base and the strip lines were then plotted on graph paper and the height measurements were entered in the respective squares. The heights were grouped together according to the quality class as shown against the age of the plantation in the revised All-India Yield and Stand Tables recently prepared by the Forest Research Institute, Dehra Dun and given in Appendix VI of the plan. These yield tables are still not available as they are said to be now under print, but the top height/age relationship for the different All-India Site quality classes were made available through the kind courtesy of the Head, Division of Forestry, Forest Research Institute, Dehra Dun on special request.

300. Coloured quality class maps were then prepared on a scale of 16 inches to a mile (1 cm. = .0396 kilometre). These quality class maps which have been appended to this plan will be found useful in assessing the proper espacement of stems at the time of thinning.

301. The teak plantations of Bolampatti fall under the different All-India Site Quality Classes as shown below :—

All-India site Quality class.	*Area in acres (hectares).*		*Remarks.*
(1)	(2)	(3)	(4)
I	Nil.	Nil.	
II	31·68	(12·81)	
III	223·04	(90·26)	
IV	126·91	(51·35)	
Below IV	0·38	(0·15)	
Total ..	382·01	(154·59)	

NOTE.—Failed patches within the areas originally planted with teak have been excluded in the above classification.

302. A detailed statement showing the particulars of areas in each plantation falling under the different All-India Site quality classes are given in Appendix V.

303. (*b*) *Rate of growth of plantation teak.*—In order to ascertain the rate of growth of plantation teak, the writer carried out measurements of girth at breast height over bark of individual trees of known site quality while stock-mapping the teak plantations of the range. Girth measurements in respect of 25 trees of each site quality in every plantation were carried out. The averages of girth for each plantation were calculated arithmetically separately for each All-India Site Quality Class and plotted on graph paper. Mean

curves were then drawn separately for each site quality class showing the relationship between age and girth over-bark at breast height. The values obtained from these curves (which have been filed with the working plan records) are tabulated below :—

Age in years.	*Girth over bark at breast height in inches (centimetres)*		
	Quality II	*Quality III*	*Quality IV*
1	0·5 (1·27)	0·5 (1.27)	0·5 (1·27)
2	1·1 (2·79)	1·0 (2·54)	0·9 (2·29)
3	2·0 (5·08)	1·8 (4·57)	1·6 (4·06)
4	3·0 (7·62)	2·6 (6·60)	2·4 (6·09)
5	4·3 (10·92)	3·7 (9·40)	3·3 (8·38)
6	5·6 (15·24)	5·0 (19·70)	4·4 (11·18)
7	7·2 (18·29)	6·3 (16·00)	5·4 (13·72)
8	8·7 (22·10)	7·5 (19·05)	6·5 (16·51)
9	10·9 (27·69)	9·0 (22·86)	7·7 (19·56)
10	12·5 (31·75)	10·5 (26·67)	9·0 (22·86)
11	14·4 (36·58)	12·0 (30·48)	10·6 (26·94)
12	16·0 (40·64)	13·7 (34·80)	12·0 (30·48)
13	17·7 (44·96)	15·4 (39·11)	13·7 (34·80)
14	19·8 (50·29)	17·0 (43·18)	15·2 (38·61)
15	21·5 (54·61)	19·0 (48·26)	16·5 (41·91)
16	23·0 (58·42)	20·5 (52·07)	18·0 (45·72)
17	24·6 (62·48)	21·9 (55·63)	19·4 (49·28)
18	26·0 (66·04)	23·5 (59·69)	20·7 (52·58)
19	27·5 (69·85)	25·0 (63·50)	22·0 (55·88)
20	28·6 (72·64)	26·4 (67·06)	23·4 (59·44)
21	21·7 (75·44)	27·6 (70·10)	24·5 (62·23)
22	30·6 (77·72)	28·7 (72·90)	25·7 (65·28)
23	31·5 (80·01)	29·6 (75·23)	26·8 (68·07)
24	32·5 (82·55)	30·6 (77·72)	27·7 (70·36)
25	33·3 (84·58)	31·5 (80·01)	28·6 (72·65)
26	34·1 (86·61)	32·3 (82·04)	29·6 (75·18)
27	34·8 (88·39)	33·1 (84·07)	30·5 (77·47)
28	35·5 (90·17)	34·0 (86·36)	31·4 (79·76)
29	36·2 (91·95)	34·7 (88·14)	32·2 (81·79)
30	36·8 (93·47)	35·2 (89·41)	33·0 (83·82)
31	37·4 (95·00)	35·8 (90·93)	33·6 (85·34)
32	38·0 (96·52)	36·4 (92·46)	34·2 (86·87)

304. It is seen from the above, that the site quality expresses itself quite early in the life of the plantation, the distinction becoming quite apparent from the 10th year of the plantation.

305. It would have been interesting to compare these figures with the crop diameter figures shown against the corresponding ages for the different site qualities in the All-India Tables. Unfortunately, this was not made possible, as the crop diameter-age relationship for the different All-India Site Qualities in the latest yield tables for plantation teak (prepared by the Forest Research Institute, Dehra Dun) on which this site quality classification is based are not available as they are said to be still under print.

306. It would be however worthwhile to make a comparison of the data arrived at above in respect of Site Quality III areas with the diameter at breast height (over-bark) measurements arrived at for the corresponding ages by stem analysis conducted on plantation teak (*vide* paragraph 311). The data arrived at by both the methods are almost similar.

307. (*c*) *Rate of growth of matchwoods.*—In order to ascertain the rate of growth of *Poola* (*Salmalia malabarica*) and *Pimaram* (*Ailanthus excelsa*) grown in plantations in the Bolampatti Valley for the first few years of their life, sample plots one square chain in extent were laid out in each plantation and the girths at breast height of all the best shoots were recorded. Readings for six years alone were available as the oldest regular matchwood plantation in the range dates to 1954. Four plots were measured. The average girth per shoot in each of the four plots for each age was calculated arithmetically and

plotted on square paper and mean curves were drawn separately for the two species showing the relationship between age and girth over-bark. The values obtained from those curves (which have been filed with the working plan records are tabulated below) :—

(a) *Poola (Salmalia Malabarica)*

Age in years. (1)	*Girth over-bark at breast height in inches (centimetres).* (2)
1	4·7 (11·94)
2	6·8 (17·27)
3	8·9 (22·61)
4	11·5 (29·21)
5	14·4 (36·58)
6	17·6 (44·20)

(b) *Pimaram (Ailanthus Excelsa)*

Age in years. (1)	*Girth over-bark at breast height in inches (centimetres).* (2)
1	1·3 (3·30)
2	4·6 (11·68)
3	8·0 (20·32)
4	11·5 (28·45)
5	14·2 (36·07)
6	17·4 (44·20)

308. The above figures indicate that *Poola (Salmalia malabarica)* is faster grown than *Pimaram (Ailanthus excelsa)* during the first three years, and thereafter the rate of growth of both the species is practically similar.

309. (*d*) *Stem Analysis.*—Two plantation grown teak trees from the 1908–10 teak plantation at Sadivayal of average site quality for the range, viz., Quality III were felled and analysed primarily to determine the age at which the Current Annual Increment and the Mean Annual Increment would be equal, for fixing the optimum rotation age for plantation teak and the diameter at breast height reached at the rotation age thus fixed. The analysis also helped in studying the relationship between age and height, age and diameter, age and volume, and diameter and bark thickness.

310.—It is seen from the increment curves drawn from the data thus collected, that the Current Annual Increment starts falling off from the 36th year, and at the 58th year the Current Annual Increment is equal to the Mean Annual Increment.

311. The sub-joined tabular statement was prepared from the curves.

Number of trees felled = 2 .. .. .. Locality=1908-1910 teak plantation at Sadivayal.

Teak tree number I.	*Teak tree number II.*
Age=51 years	Age=50 years
Total height of the tree=64′6″ (19·66 metres)	Total height of the tree=67′66″ (20·57 metres).
Girth over-bark at breast height=4′5″ (1·35 metres).	Girth over-bark at breast height=4′ 6″ (1·37 metres).
Site quality=III	Site quality=III

	Age in years.						
	10	20	30	40	50	58	60
Height in feet	23·0	38·0	51·0	61·5	69·8	74·6	75·5
Diameter at breast height (over-bark) in inches.	4·0	8·4	12·2	15·3	17·9	19·2	19.6
Volume of stem wood in cubic feet.	1·0	7·0	16·7	28·7	39·8	47·0	48.9
Current Annual Increment	0·30	0.80	1·17	1·25	1·02	0·86	0·70
Mean Annual Increment.	0·09	0·34	0·56	0·72	0·79	0·82	0·86

312. Stem analysis was also conducted on two trees of Rosewood (*Dalbergia latifolia*) and one tree of Venteak (*Lagerstoemia lanceolata*) in order to determine the ages at which the exploitable girths fixed for these species for selection working are reached, and in general to determine the relationship between age and height, age and diameter, age and volume and diameter and bark thickness.

313. Curves showing the relationship between age and height, age and diameter, age and volume, and diameter and bark thickness were drawn. The sub-joined statement was prepared from the curves :—

Rosewood (*Dalbergia latifolia*). Tree No. I.

Age=76 years. Locality=Singapathy.

Total height of the tree=96′ 4″ (29·36 metres).

Girth over-bark at breast height=6′ 99″ (2·96 metres).

	Age in years.						
	10	20	30	40	50	.60	70
Height in feet	23·0	38·0	51·5	63·4	72·5	80·9	87·2
Diameter at breast height (over-bark) in inches.	4·0	7·0	10·3	13·5	16·8	20·0	23·2
Volume of stem wood in cubic feet.	1·0	4·2	10·6	22·5	41·0	66·2	97·0
Current Annual Increment.	0·20	0·47	1.00	1·60	2·27	2·90	3·30
Mean Annual Increment ..	0·75	0·21	0·35	0·55	0·82	1·10	1·38

Rosewood (*Dalbergia latifolia*). Tree No. II.

Age=83 years. Locality=Ittimarathupallam.

Total height of the tree=95′ 6″ (29·11 metres).

Girth over-bark at breast height=7·9″ (2·36 metres).

	Age in years.							
	10	20	80	40	50	60	70	80
Height in feet	26	40	52	63	71	79	86	92
Diameter at breast height (over-bark) in inches.	3·5	7·0	10·6	14·0	17·6	21·2	25·0	28·4
Volume of stem wood in cubic feet.	1·0	4·00	10.5	23·8	43·5	73·0	111·2	162·0
Current Annual Increment ..	0·20	0·40	0·86	1·60	2·55	3·50	4·50	4·8
Mean Annual Increment ..	0·10	0·20	0·35	0·57	0·86	1·20	1.60	2·0

Venteak (*Lagerstroemia lanceolata*).

Age=94 years. Locality=Ittimarathu depot. Total height of the tree=89 feet (27.13 metres). Girth over-bark at breast height=7 feet 8 inches (2.34 metres).

	Age in years.								
	10	20	30	40	50	60	70	80	90
Height in feet	23·2	39 2	52·0	62·0	69·5	75·0	79·5	83·0	86·0
Diameter at breast height (over-bark) in inches.	4·8	7·8	11·0	14·1	17·3	20·6	23·8	26·7	28·6
Volume of stem wood in cubic feet.	1·3	5·6	14·5	28·0	50·2	78·0	110·5	141·5	169·00
Current Annual Increment.	0 40	0·60	1·00	1.70	2·50	3·07	3·40	2·84	2·16
Mean Annual Increment ..	0·10	0 26	0·45	0·70	1·00	1·30	2·55	1·77	1·85

314. It is interesting to note that the culmination point of the Current Annual Increment is not reached in the case of either of the Rosewood (*Dalbergia latifolia*) trees analysed.

315 In the case of Venteak (*Lagerstroemia lanceolata*), the Current Annual Increment starts falling off from the 70th year, but the Mean Annual Increment is seen to rise even at 90 years.

PART II.

Future management discussed and prescribed.

CHAPTER I—BASIS OF PROPOSALS.

SECTION 1—GENERAL OBJECTS OF MANAGEMENT.

316. The objects of management may be briefly stated as follows :—

(i) To conserve the forests, especially those occurring in the catchment areas of all the streams and rivers, in the interest of soil conservation, water-supply and agriculture in the plains below;

(ii) To enhance the value of the forests in the plains and foot-hills of the Bolampatti Valley by planting intensively all suitable areas with teak and other valuable species and by tending the existing plantations with a view to obtain the maximum yield;

(iii) To secure maximum returns from the existing forests by extracting the mature teak, rosewood and other merchantable species in the mixed deciduous forests along the upper slopes of Bolampatti Blocks I and II Reserved Forests with due regard to silvicultural principles and requirements;

(iv) By exploiting with due regard to silvicultural principles the resources of the forests in fuel, bamboo and minor forest produce, particularly with a view to meet the requirements of the local population to the extent possible;

(v) To afford maximum amenities to the neighbouring or resident population by providing forest grazing consistent with the principles of conservancy; and

(vi) To cater to the domestic needs of the aboriginal tribes who depend on the forest for their livelihood.

SECTION 2—METHODS OF TREATMENT TO BE ADOPTED.

317. The methods of treatment to be adopted varies with each of the working circles and are described in detail in the following chapters. Prescriptions and suggestions on matters not covered by the different working circles are indicated in the chapter on 'Miscellaneous Regulations'.

SECTION 5—BLOCKS AND COMPARTMENTS.

318. In accordance with the objects of management set forth above, six working circles have been constituted. The following statement shows the distribution of the several working circles :—

	Number and name of the working circle.	*Area in acres (hectares).*
	(1)	(2)
1	The Teak Conversion Working Circle	1,763·02 (713·47)
2	„ Selection Working Circle	6,000 (2,428·14)
3	„ Fuel Working Circle	11,681 (4,727·18)
4	„ Bamboo Working Circle	36,456 (14,754·19)
5	„ Minor Forest Produce Working Circle	All the reserves and unreserves within the range.
6	„ Grazing Working Circle	All the forests of the range excepting areas specifically closed to grazing.

SECTION 4—PERIOD OF THE WORKING PLAN.

319. This working plan will be in force for a period of ten years from 1st April 1962 to 31st March 1972. Indications regarding the areas to be worked in the succeeding five years have also been made, so that the work may be carried on according to this plan, in case the next revision of the plan is not taken up in time.

SECTION 5—BLOCKS AND COMPARTMENTS.

320. *Blocks.*—Since the three main reserves constituting the range are rather large, the division of the area into blocks by T. V. Venkateswara Ayyar and continued by Van Haeften will be continued during the period of this plan too, as the blocks serve to identify the locality. Some of the existing large blocks are divided into smaller blocks adopting natural features as boundaries and well-known local names. The following statement exhibits the names of the blocks in the range. The block boundaries have been exhibited on the concerned management maps :—

Serial number.	*Name of the Block.*
1	Waterfall
2	Thenkaradu
3	Sholakarai
4	Chavadi
5	Ayyaswami South
6	Ettimadai
7	Sundakamuthur
8	Kalampalayam
9	Ayyaswami North
10	Konamalai
11	Kuthady
12	Mangalapalayam
13	Iruttupallam
14	Singapathy
15	Sadivayal
16	Kallar
17	Narasapuram
18	Ichikuli
19	Marudamalai.

321. *Compartments.*—The existing sub-division of the blocks into compartments do not serve any purpose in our method of management. No compartment boundaries exist on the field and no compartment histories have ever been maintained. The maintenance of the compartment boundaries would not be practically possible too. The division of the area into compartments will not be therefore continued for the period of this plan.

CHAPTER II—WORKING PLAN FOR THE TEAK CONVERSION WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

322. *Objects of management.*—The objects of this working circle would be to manage the existing teak plantations in the Bolampatti Range and to convert the mixed deciduous forests in suitable localities into the more valuable teak plantations. The range has teak plantations raised since 1908, and judged by their results teak planting has proved amply successful as the intermediate yield from thinnings alone have so far proved quite remunerative. It is therefore extremely desirable to extend further planting to the extent suitable localities are available for this purpose.

323. *General constitution.*—This working circle will include all the teak and hardwood plantations in the Vellapathy and Kalkothipathy series raised during past plans and the Second Five-Year Plan Schemes, and the deciduous forests in the comparatively level portions of the 'terai' at the western extremity of the Bolampatti Valley, lying on either sides of the Coimbatore–Siruvani Road and proposed for conversion into teak during the period of this plan.

324. *Area.*—The area of this working circle will be 1,763.02 acres (713.47 hectares). Of this, an area of 550.01 acres (222.58 hectares) are now covered with existing teak plantations. For convenience in management, the patches of few miscellaneous plantations raised along with teak and constituting in all an area of 203.48 acres (82.34 hectares), blanks and failed patches occurring within the individual plantations are also included in this working circle. A detailed statement showing the areas planted up so far, the areas now stocked with teak or hardwood, failed patches, blanks, areas falling under the different All-India Site Qualities (in respect of teak only) and such other particulars are given in Appendix IV.

325. *Character of the vegetation.*—The unfelled portions of this working circle proposed to be taken up for conversion into teak plantations consist of a high forest of mixed deciduous type in which *Pillamarudu* (*Terminalia paniculata*), *Vengai* (*Pterocarpus marsupium*), Rasewood (*Dalbergia latifolia*), *Thadasu* (*Grewia tiliaefolia*), *Karuvagai* (*Albizzia odoratissima*), *Vagai* (*Albizzia lebbek*), *Velvagai* (*Albizzia procera*), Venteak (*Lagerstroemia lanceolata*), *Palai* (*Wrightia tinctoria*) and bamboos are the chief valuable species. The Singapathy Valley supports the best of this type, Rosewood being particularly wellgrown and not frequently of fairly large dimensions.

326. A fuller description of the forest type is given in Chapter II of Part I.

SECTION 2—DIVISION OF THE AREA.

327. *Division into felling series.*—The working circle is divided into two felling series as follows :—

Serial number and name of felling series.	*Area already planted in acres (hectares).*	*Area to be planted up in acres (hectares).*	*Total area in (acres) hectares.*
(1)	(2)	(3)	(4)
1. Vellapathy	704·67 (285·17)	904 (365·84)	1,608·67 (651·01)
2. Kalkothipathy	154·35 (62·46)	..	154·35 (62·46)

SECTION 3—ANALYSIS AND VALUATION OF THE CROP.

328. *Stockmapping areas suitable for teak planting.*—No enumeration or valuation surveys of the forests proposed for conversion were made by the working plan party as the existing heterogeneous growth consisting of only fuel and small timber do not permit any detailed valuation surveys. The areas have been, however, stock-mapped by an ocular estimate indicating their probable fuel yield in tonnage classes on the map so as to facilitate the preparation of the financial forecast for this plan.

329. In stockmapping the areas for their probable yield, the suitability of the areas for teak planting has been judged with reference to the quality and composition of the standing crop, slope of the terrain and drainage. The presence of a mixed deciduous forest with Venteak (*Lagerstroemia lanceolata*), *Karuvagai* (*Albizzia odoratissima*) and *Pillamarudu* (*Terminalia paniculata*) of good height growth mixed with well-grown bamboo, was considered to indicate suitability for teak planting. Steep slopes, tops of hillocks, poorly drained areas, swamps (patent or potential), sites with a semi-evergreen type of growth and areas carrying a stand of stunted trees were excluded. Small patches of such unsuitable areas occurring within the selected areas will have to be, however, omitted by the District Forest Officer during the actual layout of the plantation.

SECTION 4—METHOD OF TREATMENT.

330. Strange as it may seem, the Bolampatti Valley although containing no natural teak, the plantations raised in the valley have proved quite successful. There is no doubt to the fact that a teak plantation formed in this locality although of lower quality is

decidedly much more valuable than the mixed crop it replaces and the cost of such plantation is more than covered by the revenue realised by the sale of the existing growth, not to speak of the increased revenue in future. The treatment proposed therefore is to clear-fell the existing mixed deciduous forests in suitable areas and plant them up with teak in as short a time as possible.

331. *Silvicultural system.*—The silvicultural system adopted in this working circle will be the clearfelling system followed by concentrated artificial regeneration.

332. *Choice of species.*—The species to be used in regenerating the clearfelled areas will be teak. Since drainage appears to be the chief limiting factor for teak in the Bolampatti valley owing to the admixure of black cotton soil, patches of ill-drained soil occurring within the annual regeneration area will be planted with *Karumarudu* (*Terminalia tomentosa*), as this species has shown the best performance of all the miscellaneous species tried in past plantations.

333. Rosewood (*Dalbergia latifolia*) and *Vengai* (*Pterocarpus marsupium*) will also be tried in small areas within the regeneration area otherwise not suitable for teak, according to the suitability of the site, as per the suggestions made by the Chief Conservator of Forests in the Reconnaissance Report submitted prior to the preparation of this plan. Although these species have not fared well in the plantations raised so far, efforts to raise them successfully in areas unsuited for teak should be persisted as they are decidedly more valuable than *Karumarudu* (*Terminalia tomentosa*). Owing to past failures, the artificial introduction of Rosewood (*Dalbergia latifolia*) and *Vengai* (*Pterocarpus marsupium*) should be however only on an experimental level to start with until successful results are obtained. The results will be reviewed at the end of 5 years by the Conservator of Forests and the continuance or cessation of further planting ordered depending on the success or failure of the experiment.

334. *Rotation.*—A rotation of 40 years was arbitrarily adopted for the Bolampatti teak plantations in both the previous plans of Venkateswara Ayyar and Van Haeften. It was hoped that at the end of the rotation thus fixed, the site will produce the type of timber it is capable of. The rotation thus fixed was only theoretical and did not bear any relation to the annual rate of conversion that was decided upon.

335. Detailed quality class stock-mapping of the existing teak plantations (vide paragraph 301 of Chapter VI of Part I) has shown that the majority of them fall under All-India Site Qualities III and IV as per the revised All-India Teak Yield Tables prepared at the Forest Research Institute, Dehra Dun. Hence, it may be reasonable to assume that it would be improper to attempt to grow timber of large sizes on a long rotation in localities of low site quality. Under these circumstances it would therefore appear that it would be better to grow them for poles on a shorter rotation, but since the Bolampatti plantations have a tendency for branchiness, most of them may not be available in the form of Electric Transmission Poles in which category alone they have the largest demand for meeting the State Rural Electrification Schemes. It was therefore considered best to grow these plantations for timber only to such a size that the site quality would permit without any depreciation in the Mean Annual Increment.

336. With this end in view, two plantation grown teak trees from the 1908–10 plantation which is the oldest plantation in the range were felled and analysed. The trees selected for stem analysis were of site quality III corresponding to the average site quality for the locality. The details of the stem analyses done are given in Chapter VI of Part I. The increment curves drawn indicate that the Current Annual Increment starts falling at the 36th year and at the 58th year the Current Annual Increment is equal to the Mean Annual Increment. It is at this age the Mean Annual Increment starts falling and is the age of ' maximum ' volume production. Rounding off the figure of 58 to 60, the rotation will be fixed at 60 years. Diameter-age curves drawn indicate that plantation teak attains a girth of 5 feet 1 inch (1.549 metres) over-bark at breast height in 60 years in areas of quality III. It is however quite possible that the rate of diameter growth for plantation

teak for the locality may be even a little faster than in the data exhibited in paragraph 311 of Chapter VI of Part I as the 1908–10 plantation which is the oldest in the range does not seem to have been thinned regularly in the past and no records are available to verify this. The trees felled for stem analysis were also within the age range of 50–51 years and the curves drawn had to be produced further to study the rate of increment. It is therefore suggested that this data be checked up when subsequent revisions of the working plan for the range are taken up and the rotation refixed if found necessary.

337. *Regulation of the yield.*—Excluding the experimental teak plantations of 1908 and 1925, the regular series of plantations commence from 1928. As the oldest regular plantation is only 32 years of age, no fellings are contemplated during the period of this plan. Hence the question of regulation of the yield at least as far as the existing plantations are concerned will not arise at present.

338. *Annual regeneration area.*—It is generally understood that in artificial regeneration the proper procedure to determine the annual regeneration area would be to divide the total area of the felling series by the rotation fixed so as to obtain an even series of successive age gradations at the end of the conversion period. Although this idea is aimed at achieving a normal forest as early as possible, the chief aim of regenerating equiproductive areas each year is with the object of preventing sacrifice of immature crops at a later date when the forest will have to be normalised. The argument, although no doubt is borne on scientific reasoning, will not justify even on economic considerations alone because the major part of the revenue from teak plantations is from thinnings which are performed well before half the rotation age is reached. The principles of sound forest management require, however, that a forest should be brought into a state of full production as soon as practicable, without prejudice to economic and other related factors. So, if the pace of conversion is kept slow, a large amount of capital would be kept bottled up with practically no interest or revenue derived therefrom. Forest management has to be sustained, but at the same time 'dynamic'. It should be therefore our aim to convert the natural forests included in this working circle at as early a date as possible. It is therefore prescribed that an area of not less than 100 acres (40.46 hectares) will be planted annually subject to the condition that funds are forthcoming.

339. The question of normalising the forests already converted can be taken up when the plantations come for final fellings, without any detriment to financial interests.

X

SECTION 5—METHOD OF EXECUTING FELLINGS.

340. *Selection of the area.*—The lay out of the areas annually proposed for conversion are shown on the concerned management maps.

341. *Demarcation and survey of the annual conversion area.*—The annual conversion coupe will be surveyed and demarcated by means of cleared lines 6 feet (1.83 metres) wide. This should be completed at least 15 months before the month of planting so as to ensure that the preliminary regeneration operations are carried out as per schedule and timely planting done. While laying out the coupe, an enumeration of the valuable timber in the coupe should be made by the Range Officer and the total cubical contents of timber in the coupe should be calculated so as to arrive at the fair price forecast more correctly.

342. *Agency of exploitation.*—The annual coupe to be felled for conversion will be exploited through the agency of contractors.

343. *Period of exploitation.*—The coupes will be put up for sale by open auction in February so as to allow time for resale by tender or by auction in case satisfactory prices are not obtained in the first sale. The period of lease will be not more than 9 months

from 1st April to 31st December. Late sales allowing coupe *voidahs* until 31st of March with very little time left for preparation of the planting site has been the main cause of late planting during the past few years. It is therefore necessary that the lease period should not extend beyond the 31st of December under any circumstances.

344. *System of exploitation.*—The contractor will be required to cut all growth to a height not exceeding 6 inches (15 cms.) from the ground. In order to reserve sufficient material on the grounds to ensure a burn, twigs and branches below 6 inches (15 cms.) in girth should not be removed. For this purpose, removals by head loads will be prohibited.

345 If there is any likelihood of the contractor being unable to finish the work of felling and removal within the allotted period, the produce left over if any will be forfeited to Government, and any or all of the operations will be done departmentally. No extension of *voidah* beyond 31st December will be granted under any circumstances.

Section 6—Tabular Statement of Fellings.

346. The following statement shows the coupe number, the areas of the coupe for each series, and the planting programme for the ten year period 1962-1972.

Year of clear felling.	*Year of planting.*	*Coupe number.*	*Area of annual coupe in acres (hectares)*	
			Vellapathy.	*Kalkothipathy.*
(1)	(2)	(3)	(4)	(5)
1961–62	1962–63	I	84 (33·99)	..
1962–63	1963–64	II	98 (39·66)	..
1963–64	1964–65	III	118 (47·76)	..
1964–65	1965–66	IV	116 (46·95)	..
1965–66	1966–67	V	106 (42·90)	..
1966–67	1967–68	VI	104 (42·09)	..
1967–68	1968–69	VII	110 (44·52)	..

347. No further planting is prescribed beyond 1968–69 as no suitable areas are available within the range.

Section 7—Regulation of Regeneration Operations.

348. *Kumri or Ponam.*—As far as possible, the plantations to be raised under this working circle will be by the *Kumri* or *ponam* method as done hitherto, as there is a good demand for *ponam* cultivation locally. Practically all the plantations raised in the Bolampatti valley so far have been by the *ponam* method, and most of them too at practically no costs to the management. *Ponam* cultivation in regeneration areas has various advantages, viz., substituting a less deleterious weed like the field crop for the more dangerous *Lantana* and local weed growth ensuring better protection of the crop from wild animals, more or less free weeding of the tree crop during the period of growth of the cereal crop, ultimately contributing to better initial growth of the plants and thereby a successful plantation. Incidentally, more food is grown and this apart from keeping in line with the policy of the Government could certainly help in tackling the present food shortage to a certain extent. To attract *ponamdars* and even allow them to do free cultivation of an agricultural crop in conjunction with the planted teak is to our advantage and therefore all efforts should be made to promote *ponam* cultivation. Locally there is a keen demand for *ponam* cultivation from the villagers of Alandurai, Semmedu and Thombilipalayam apart from the resident population of Irulars and Muduvars within the

Jungle itself. During the past few years local villagers seem to have been preferred to the hill-tribes as the latter are said to be not quite willing. It should be however the endeavour of the management to give preference to the hill-tribes if they come forward as they are part and parcel of the jungle.

349 The *ponamdars* will be allowed to raise food crops like ragi, *cumbu*, *varagu*, horse-gram and chillies. Castor and *cholam* will be prohibited as they grow very tall quite fast and are likely to suppress the comparatively slower grown teak. The *ponamdars* will be permitted to remain in the regeneration area for the first two years of the plantation.

350. As at present, *ponamdars* will be insisted to do all the weedings free of cost. Insisting on the *ponamdars* to do the other regeneration operations also free of cost although economically laudable is fraught with dangers, since the various stages of plantation work are likely to be delayed and the privilege also abused by them. The rest of the other operations will be therefore done departmentally.

351. In the eventuality of *ponamdars* not being available, the plantation work should go on as usual keeping up to the schedule and the weedings done at departmental cost. Lack of *ponamdars* should not hold up the regeneration works at any cost.

Preparation of the planting site.

352. *Burning.*—Immediately after the contractor vacates the coupe, all the regrowth will be cleared. The felling slash left over by the contractor should be evenly spread all over the area and burnt during February-March. The materials left unburnt will be piled in scattered heaps over unburnt patches and reburnt by the end of March. Both these operations will be done under supervision. The desirability of obtaining a good burn and as far as possible an even burn over the whole area in the first instance cannot be over emphasised. Piling and reburning are expensive operations and should be reduced to the minimum possible.

353. *Aligning and staking.*—The espacement will continue to be 6 feet by 6 feet (1.83 metres by 1.83 metres) as at present. The establishment of a thick growth of *Lantana* and *Eupatorium* is common in the Bolampatty Valley on any opening and it would be much more difficult to control these pests with widely spaced out teak plants. The generally adopted espacement of 6 feet by 6 feet (1.83 metres by 1.83 metres) which had stood the test for many years is therefore prescribed for these areas as the site quality is low. The same espacement will be adopted for the other species also. The aligning and staking should be completed by the middle of April.

354. *Method of planting.*—All the species will be planted as stumps in the areas to be regenerated.

355. *Planting.*—The areas included in this working circle receive rains from both the monsoons. Planting of all the species should be done preferably during the pre-monsoon showers as soon as the ground becomes sufficiently moist to make 10 inches (25.4 cms.) deep crow-bar holes. This is particularly emphasised since plantings have been repeatedly delayed during the past few years. For this locality usually the planting season will be from the 15th of May to the 15th of June, depending upon the annual and local variations of rainfall This early planting gives a great increase in height growth over planting at the beginning of the monsoon. The risk of failure is slight and can be cheaply insured against by keeping a stock of stumps for replacing the casualties at the beginning of the monsoon. Planting during the regular south-west monsoon when the rains are apt to be heavy results in excessive holding of moisture in flattish bits, as the soil is chiefly black cotton, resulting in poor aeration and rotting of stumps. This leads to heavy casualties and ultimately a very un-uniform plantation.

356. One year old stumps about 10 inches (25.4 cms.) long with 9 inches (22.86 cms.) of root and 1 inch (2.54 cms.) of root and 0.4 to 0.8 inches (1 to 2 cms.) thick at the collar prepared from nursery raised seedlings should be used. Stumps should be planted firmly in crow-bar holes flush with the ground level, but if the soil is likely to be washed away during the rains, half an inch (1 cm. approximately) below the ground is preferable. The soil should be well compacted taking care not to leave any air space between the stumps and the soil.

357. Original planting should be done always on one definite side of the stake and replacements on the other.

358. Both teak and the other species will be grown pure, but in transition zones of doubtful suitability both teak and one of the secondary species, *Karumarudu* (*Terminalia tomentosa*), Rosewood (*Dalbergia latifolia*) and *Vengai* (*Pterocarpus marsupium*) will be placed at the same stake.

SECTION 8—NURSERY.

359. Nurseries will be required for raising stumps of teak, *Karumarudu*, Rosewood and *Vengai*.

360. *Seed collection and storage.*—Local seeds should be collected as far as possible. Since many of the characteristics of teak are probably hereditary, it is essential that seed be collected only from trees of good, straight growth and form. Trees of twisted grain or low branching habit should be rejected for seed collection. Seeds should be collected preferably from trees above 20 years of age, as seeds collected from immature or even very old trees are said to have a lower germination per cent. In the case of teak and *Karumarudu* (*Terminalia tomentosa*) where older plantations exist, trees of plantation origin should be preferred as they are generally straight grown and are of known age and better progeny.

361. The following table indicates the time for seed collection for the species suggested for planting :—

Serial number and name of the species. (1)	*Time of collection of seed.* (2)
1. Teak (*Tectona grandis*)	January–February.
2. *Karumarudu* (*Terminalia tomentosa*)	February–March.
3. Rosewood (*Dalbergia latifolia*)	February–March.
4. *Vengai* (*Pterocarpus marsupium*)	January–March.

362. Seed may be conveniently collected by clearing the ground under the trees and the branches lightly beaten off by means of long sticks. The dry pericarp of the teak fruits should be removed soon after collection. All the seeds should be dried and stored in gunnies under cover in airy rooms.

363. *Nursery site.*—The nursery site should be preferably formed in the regeneration area itself as against the present practice of having a permanent nursery. A temporary nursery has definite advantages over a permanent one by reducing the cost of transport of stumps besides reducing the damage by cockchafers. The number and quality of stumps produced would be also definitely superior owing to the virgin soil. The nursery site should have a good loamy soil. Clayey and very gravelly sites should be avoided as this will result in short, inferior and branchy stumps. All nursery sites should be approved by the District Forest Officer.

364 *Formation of beds.*—The nursery site should be cleared of all growth, and stumps if any uprooted. The soil should be dug to a minimum depth of 18 inches (45.3 cms.), the clods broken and the soil allowed to weather for a couple of months. Stones and pebbles if any should be carefully removed from the soil as these will result in bending of the roots. Standard beds of 40 feet by 4 feet (12.2 metres by 1.2 metres) should be formed leaving an intervening space of 1½ feet (0.45 metres) to facilitate watering, weeding and inspection. The beds should be raised 9 inches (23 cms. approximately) high supported at the sides by split bamboos, poles or other convenient material, so as to ensure good drainage. Beds should be laid along the contour and not across it. The surface of the beds should be given a slight camber to prevent stagnation of water. No shading of the beds will be normally required. The formation of the beds should be completed by the end of April at least.

365. *Size of nursery.*—One bed of standard size 40 feet by 4 feet (12.2 metres by 1.2 metres) is reckoned as sufficient for raising 1 acre (.40 hectare) of plantation of teak or *Karumarudu* (*Terminalia tomentosa*) as the case may be at an espacement of 6 feet by 6 feet (1.83 metres by 1.83 metres). A few additional beds should be formed to provide for replacement of casualties.

366. Of the other species, Rosewood (*Dalbergia latifolia*) and *Vengai* (*Pterocarpus marsupium*), about 1,800 stumps may be expected from a standard bed, which will allow for 1½ acres (.60 hectare) of planting at the same espacement.

367. *Sowing.*—In order to ensure that fully stocked beds are obtained, dense sowing is advocated, 30 lbs. (14 kilograms approximately) of seeds per bed would be sufficient for teak or *Karumarudu* (*Terminalia tomentosa*). For the other two species, Rosewood and *Vengai* (*Dalbergia latifolia* and *Pterocarpus marsupium*), a bag of seeds (50 Madras Measures) are necessary for a standard bed.

368. No pretreatment before sowing is needed either for teak or for *Karumarudu* (*Terminalia tomentosa*). The pods of Rosewood (*Dalbergia latifolia*) should be broken up before sowing and those of *Vengai* (*Pterocarpus marsupium*) soaked for 48 hours in an emulsion of cowdung and water.

369. The seeds should be sown early in May and covered with a layer of fine soil to a depth equal to the thickness of the seed. The sowing must be done in separate beds for each of the species. The beds should then be covered with scattered twigs of *Nellikai* (*Emblica officinalis*) or similar light leaved material and finally a layer of straw. The twigs will prevent the straw being washed into the soil and facilitate removal of the straw without damaging the germinating seeds. As soon as germination is observed, the straw must be removed. The beds should be watered regularly on non-rainy days until the onset of the monsoon.

370. *Weeding.*—The nursery beds should be kept clean weeded always and the soil loosened between plants now and then as necessary.

371. A most important thing in the raising of a teak nursery is the necessity to raise a well stocked crop of seedlings of uniform height. In order to achieve this, it is very necessary to pluck off the few more robust seedlings which outgrow the rest and result in 'wolves'. These 'wolves' if not removed completely, suppress the rest of the seedlings, finally resulting at the end of the first year, a nursery bed consisfing of about a couple of hundred woody seedlings scattered over a mass of suppressed tiny seedlings thoroughly useless for the production of stumps.

372 *Preparation of stumps.*—Teak stumps with a diameter range of 0.4 to 0.8 inch (1 to 2 cms.) at the collar give the best results both as regards survival percentage and growth. Two year old stumps can be also used provided they are within the diameter range prescribed above. The nursery beds should be watered before the seedlings are pulled out. Removal should begin at one end of the bed and proceed towards the other end. A sufficient number of seedlings should be left in the beds to stock the nursery site at an approximate espacement of 6 feet by 6 feet (1.83 metres by 1.83 metres). The seedlings should

be removed one at a time, by holding them as near the ground as possible and gently pulled. The bark of the tap-root should not be damaged while pulling. If assistance is required, a pick-axe should be used to loosen the soil, care being taken not to damage the roots of the seedlings.

373. In making stumps it is essential to use a sharp knife; all small side roots should be trimmed off flush with the main root and the stem should be cut off about one inch (2.5 cms) above the collar. Nine inches (23 cms. approximately) of root should be left as per standard procedure.

374. Stumps for the secondary species will be prepared in similar manner as for teak

SECTION 9—SUBSIDIARY SILVICULTURAL OPERATIONS.

375. *Replacement of casualties.*—Casualties will be replaced both for teak as well as for the other species along with the south-west monsoon showers. If any further casualties occur, they will be replaced in October along with the north-east monsoon showers. Localised portions of the regeneration area where teak has failed in spite of repeated replacement of casualties due to swampy conditions will be replanted with *Karumarudu* (*Terminalia tomentosa*) stumps during the north-east monsoon. It is absolutely necessary to obtain as full a stockiing as possible in the first year itself, or else the plantation will tend to be un-uniform.

376. Individual casualties will not be replaced during the second year, but should a fairly large blank occur in the regeneration area, the District Forest Officer will have it replanted as he considers most suitable.

377. *Weedings.*—In areas where *ponam* crop is raised, weeding for the two years during which the land is occupied by the *ponamdars* should be necessarily got done by them free of cost as they are allowed to do free cultivation in the area. It is however absolutely important to insist the weeding being done before suppression sets in, either due to competition from the *ponam* crop or due to weeds. Weeding the young teak plants long after the suppression to suit the convenience of the *ponamdar* is highly detrimental to a strong light demander like teak. Weeding will consist of uprooting all grass, creepers and herbaceous plants to a radius of 1½ feet (45 cms. approximately) around each plant throughout the period of the lease. After the *ponamdar* has vacated the regeneration area, subsequently weedings will be done if necessary at departmental cost.

378. In areas where no *ponam* crop is raised, weedings will be done for the first two years. The first year weedings will be three in number—first weeding in July in strips two feet (.61 metre) on either side of the planting lines; second weeding in September along the same strips but will also include uprootal of *Lantana* and bamboo over the entire regeneration area; the third weeding will be in January which will be confined to one foot (.31 metre) radius round the plant and also include soil working to a depth of four inches (10 cms. approximately).

379. In the second year there will be two weedings. The first weeding will be early in June along the strips two feet (.61 metre) on either side of the planting lines cleared during the first year. The second weeding will be in September along the same strips and will include soil working to a depth of four inches (10 cms. approximately) around the backward plants.

380. While weedings take place in the first and the second years, pruning of the double leaders leaving the best stem and cutting of climbers found on the teak stems will be carried out. All damaged teak saplings will be cut back flush with the ground during the weedings.

381. In the third year of the plantation, both in the areas where *ponam crop* had been raised and in the areas where departmental weedings had been done, a general tending operation will be carried out, which will include climber cutting, debudding of lateral branches, cutting back of forked stems and such of the other species dominating or interfering with the teak.

382. The weedings and tendings prescribed are what are normally required for the plantations in this locality. However, in cases where special weedings and tendings are required in view of the general backwardness of any plantation, it may be done with the permission of the Conservator of Forests.

383. *Thinnings.*—In the past, proper thinnings have been neglected in the case of many plantations particularly in the Kalkothipathy Series. The thinning cycle has been repeatedly modified with the result a few plantations were skipped over during each such modification. Several of the plantations are so badly underthinned that they give the appearance of any thinnings being done at all. It must be remembered that teak is very susceptible in youth not only to suppression but also to competition, and plantations thus effected do not recover later on, even if tended properly. It is by thinning, more than any other operation, that a forester can control the destiny of a plantation and contribute to its financial success. Proper emphasis is therefore laid on timely and proper thinnings.

384. *Type of thinning.*—Since the site quality would not assert itself until the plantations are at least 10 years old, selective thinnings are prescribed only after this age. Moreover, the difference between the various plants would not be great until they reach this age, and any selective thinning to remove a part of the growing stock would not result in a better thinning. The first two thinnings will be therefore prescribed to be mechanical consisting of the removal of the alternate diagonal and the alternate planting lines. The subsequent thinnings will be prescribed to be selective.

385. *Thinning interval.*—The thinning cycle will be so fixed that all thinnings are completed within half the rotation. It is considered that thinnings done beyond half the rotation ago do not serve any purpose as teak does not respond greatly as it gets old.

386. With this end in view, the thinning cycle is empirically fixed for the 5th, 10th, 18th and 28th years.

387. For the first two thinnings which will be mechanical, the fixation of the ages for the 5th and 10th years is only theoretical and thinnings will be done only when the following two conditions are satisfied :—

(1) That the canopy has closed;

(2) The espacement conforms to a S percentage of the top height—or in other words the top height has reached 25 feet (8 metres approximately) for the first mechanical thinning and 36 feet (11 metres approximately) for the second mechanical thinning.

388. The District Forest Officer will therefore have the full discretion to postpone the dates of the first two thinnings if the above conditions are not fulfilled, subject to report to the Conservator of Forests. It is considered that a blind adherence to the thinning interval fixed in the working plan for the first two thinnings in low quality plantations is likely to do more harm than good. Hence, this discretion is given.

389. Even for the silvicultural thinnings, it must be borne in mind that the thinning interval is defined as a guide to the District Forest Officer, and that he would be at liberty to postpone the thinnings in any plantation if he considers it to be not fit, subject to the approval of the Conservator of Forests.

390. *Thinning degree or grade.*—The thinning degree for the first two mechanical thinnings will be expressed as an S percentage of the top height.

391. The first mechanical thinning will be carried out by removing all the plants in the alternate diagonal rows, by which an espacement of $8\frac{1}{2}$ feet by $8\frac{1}{2}$ feet (2.59 metres by 2.59 metres) and reduction in the stocking by 50 per cent would result. The second thinning will be carried out by removing all the plants in the alternate planting lines, by which an espacement of 12 feet by 12 feet (3.66 metres by 3.66 metres) and a reduction in the stocking by a further 50 per cent would result.

392. The average quality of the plantations being low all India III (as per the revised yield tables prepared recently at the Forest Research Institute, Dehra Dun), application of higher grades of thinning may cause heavy branching which is characteristic of the Bolampatti plantations, wind damage, and most often invasion by *Lantana* which is rapidly spreading from the Irular settlements. Hence it is prescribed that a lighter grade of thinning corresponding to C or C/D grade be done depending on the quality and condition of the crop. Thinnings heavier than C/D grade should not be advocated.

393. *Marking rules for thinnings.*—The first and second thinnings which are mechanical will be carried out by the Range Officer. Marking for the third and fourth thinnings which are silvicultural, will be done by the District Forest Officer or his Gazetted Assistant.

394. A climber cutting and removal of *Dendropthoe* or other parasites on the trees should precede every thinning, and the marking officer should ensure that these operations have been carried out properly before he commences marking.

395. Marking of miscellaneous patches within the teak plantation should be also done along with the teak adopting the same intensity of thinning until a better knowledge of the growth of these species is learnt.

396. Irrespective of the grade of thinning, all dead, dying and moribund stems should be marked for removal during the course of any silvicultural thinning. The intensity of thinning and the resultant espacement should vary with the age and condition of the crop as prescribed in paragraphs 390 and 391 above. No removal should cause a lasting gap in the canopy.

397. While marking, teak of course should receive preference but good stems of the secondary species like *Karumarudu* (*Terminalia tomentosa*), Rosewood (*Dalbergia latifolia*) and *Vengai* (*Pterocarpus marsupium*) should not be sacrificed for a poorer stem of teak as the former are also valuable. Suppressed stems of miscellaneous species forming a natural understorey should not be cut unless they interfere with the teak, as they are expected to form a soil cover, and assist in the biological control of teak defoliators.

398. As there will be no thinning after the 28th year, the stems to be retained at the final thinning will be the stems required for the final crop, plus 10 per cent to allow for the natural loss between the final thinning and the rotation age.

399. As the revised yield tables prepared by the Silviculture Branch of the Forest Research Institute are said to be still with the press, it has not been possible to quote here the espacement values obtained from the yield tables for C/D grade of thinning for the site qualities occurring in the Bolampatti Range. It is therefore suggested that the revised yield tables may be referred to (as they become available) before proceeding on marking. It should be however borne in mind that the thinnings to be done in any plantation will be mainly on silvicultural consideration, and that the espacement values given in the yield tables are intended only as a guide to the marking officer for defining the intensity of thinnings required.

400. *Thinning programme.*—The following statement gives the areas to be thinned during the ten year period of this plan :—

Year of thinning. (1)	*Name and year of the plantation.* (2)				*Area in acres (hectares).* (3)	
1962–63	Vellapathy	1958	Teak		50·00	(20·23)
	Do.	1945	Do.		18·75	(7·59)
			Miscellaneous		0·25	(0·10)
	Kalkothipathy ..	1945	Teak		9·50	(3·84)
			Miscellaneous		6·00	(2·43)
	Vellapathy	1935	Teak		11·50	(4·65)
			Miscellaneous		17·00	(6·88)

401. The following plantations which are badly congested will also undergo a thinning during 1962–63. If these plantations are left unthinned until they reach the age for the fourth thinning, the continued suppression and competition is likely to do permanent harm.

Name and year of the plantation. (1)			*Area in acres (hectares).* (2)	
Vellapathy	1942	Teak	16·50	(6·68)
		Miscellaneous	5·35	(2·18)
Kalkothipathy ..	1942	Teak	9·00	(3·64)
		Miscellaneous	0·85	(0·34)
Vellapathy	1941	Teak	5·50	(2·22)
		Miscellaneous	3·60	(1·45)
Kalkothipathy ..	1941	Teak	5·50	(2·22)
		Do.	13·62	(5·51)
Vellapathy	1940	Miscellaneous	13·12	(5·31)
Kalkothipathy ..	1940	Teak	18·40	(7·45)
Vellapathy	1939	Do.	5·50	(2·20)
		Miscellaneous	4·75	(1·92)
Kalkothipathy ..	1939	Teak	13·90	(5·62)

402. The following plantations which have already passed the age of fourth thinning will be also thinned during 1962–63 as they are very much congested due to improper thinnings in the past :—

Name and year of the plantation. (1)			*Area in acres (hectares).* (2)	
Vellapathy	1933	Teak	4·50	(1·82)
		Miscellaneous	19·75	(7·99)
Do.	1932	Teak	8·75	(3·54)
		Miscellaneous	11·50	(4·65)
Do.	1931	Teak	9·25	(3·74)
		Miscellaneous	7·50	(3·03)
Do.	1929	Teak	3·50	(1·41)
		Miscellaneous	16·50	(6·68)

403. The thinning programme for the rest of the years is given below :—

Year of thinning.	*Name and year of the plantation.*			*Area in acres (hectares).*	
(1)	(2)			(3)	(4)
1963–64	Vellapathy	1959	Teak	50·00	(20·23)
	Do.	1946	Do.	26·75	(10·82)
			Do.	22·40	(9·06)
	Kalkothipathy ..	1946	Miscellaneous	3·10	(1·25)
	Vellapathy	1936 (*a*)	Teak	10·50	(4·25)
			Miscellaneous	8·75	(3·44)
	Do.	1936 (*b*)	Teak	5·75	(2·32)
1964–65	Vellapathy	1960	Teak	30·00	(12·14)
			Miscellaneous	17·00	(4·88)
	Do.	1937 (*a*)	Teak	8·62	(3·49)
			Miscellaneous	5·75	(2·32)
	Do.	1937 (*b*)	Teak	15·25	(6·17)
			Miscellaneous	2·50	(1·01)
1965–66	Vellapathy	1961			
	Do.	1938	Teak	14·25	(5·77)
			Miscellaneous	10·75	(4·35)
	Kalkothipathy ..	1938	Teak	4·50	(1·82)
1966–67	Vellapathy	1962			
	Do.	1957	Teak	38·00	(15·38)
	Do.	1939	Teak	5·50	(2·22)
			Miscellaneous	4·75	(1·92)
	Kalkothipathy ..	1939	Teak	13·90	(5·62)
1967–68	Vallapathy	1963			
	Do.	1958	Teak	50·00	(20·23)
	Do.	1940	Do.	13·62	(5·51)
			Miscellaneous	13·13	(5·31)
	Kalkothipathy ..	1940	Teak	18·40	(7·45)
1968–69	Vellapathy	1964			
	Do.	1959	Teak	50·00	(20·23)
	Do.	1941	Do.	5·50	(2·22)
			Miscellaneous	3·60	(1·45)
	Kalkothipathy ..	1941	Teak	5·50	(2·22)
1969–70	Vellapathy	1965			
	Do.	1960	Teak	30·00	(12·14)
			Miscellaneous	17·09	(4·88)
	Do.	1942	Teak	16·50	(6·68)
			Miscellaneous	5·35	(2·18)
	Kalkothipathy ..	1942	Teak	9·00	(3·64)
			Miscellaneous	0·85	(0·34)
1970–71	Vellapathy	1966			
	Do.	1961			
	Do.	1943	Teak	23·40	(9·46)
			Miscellaneous	0·60	(0·24)
	Kalkothipathy ..	1943	Teak	13·15	(5·32)
			Miscellaneous	0·60	(0·24)
1971–72	Vellapathy	1937			
	Do.	1962			
	Do.	1944	Teak	27·05	(10·31)
			Miscellaneous	3·00	(1·21)
	Kalkothipathy ..	1944	Teak	17·10	(6·92)
			Miscellaneous	0·90	(0·36)

404. The following thinning programme is laid down for the next five years in case the revision of the plan is not taken up in time :—

Year of thinning.	*Name and year of the plantation.*			*Area in acres*	*(hectares).*
(1)	(2)			(3)	
1972–73	Vellapathy	1968			
	Do.	1963	Teak	18·75	(7·59)
	Do.	1945	Miscellaneous ..	0·25	(0·10)
	Kalkothipathy	1945	Teak	9·50	(3·84)
			Miscellaneous ..	6·00	(2·43)
1973–74	Vellapathy	1964			
	Do.	1946	Teak	26·75	(10·82)
			Do.	22·40	(9·06)
	Kalkothipathy . ..	1946	Miscellaneous	3·10	(1·25)
1974–75	Vellapathy	1965			
	Do.	1957	Teak	38·00	(15·38)
1975–76	Vellapathy	1966			
	Do.	1958	Teak	50·00	(20·23)
1976–77	Vellapathy	1967			
	Do.	1959	Teak	50·00	(20·23)

Note.—The acreage of the past plantations given here represents the actual area now stocked with teak as could be verified while detailed quality class stock-mapping of the areas were done. The areas of the plantations to be raised from 1961 onwards are however not noted as it would not be correct to give them now.

405. The thinning schedule prescribed should be followed strictly for the third and fourth thinnings unless the District Forest Officer considers postponement owing to the backwardness of any plantation or such other special circumstances. Special emphasis is laid on the schedule, since timely thinnings have not been done in the past owing to frequent changes in the thinning cycle.

406. The thinned produce will be converted into poles if their girth at butt end is 36 inches (91 cms.) and less, adopting the following classification :—

Poles below 12 inches (30.5 cms.) in girth at butt end.

Poles of 1–2 feet (30.5 to 61 cms.) in girth at butt end.

Poles of 2–3 feet (61 to 91.4 cms.) in girth at butt end.

407. Trees with a butt end diameter of 36 inches (91.4 cms.) and over will be treated as logs and measured in volume. Before conversion, trees suitable for Electric Transmission poles will be separated and converted according to the prescriptions laid down by the Forest Utilisation Officer and made available to the Electricity Board under his directions. Since the height growth of teak in the Bolampatti plantations is not appreciable and the trees subjected to branching, the number of Electric Transmission poles expected annually is not likely to be appreciable.

408. Miscellaneous growth unfit for sale as poles and top ends of teak will be converted into fuel and stacked in stacks of 5 feet by 5 feet by 5 feet (1.53 metres by 1.53 metres by 1.53 metres).

409. Both the poles and fuel will be transported to roadside depots where they will be classified in the order mentioned above and sold in auction.

SECTION 10—OTHER REGULATIONS.

410. *Plantation boards.*—Every plantation should carry at the salient corners of its periphery, conspicuous plantation boards showing the calendar year of its formation and the acreage. Such of these boards that require replacement will be renewed in the months of April every year.

411. *Inspection paths.*—Permanent and properly graded inspection paths, 6 feet (1.83 metres) wide, will be kept clean of all growth to facilitate inspection. They may conveniently be made to run so as to divide the plantation into four quarters in plain terrain. The paths will run approximately along the contour on sloping country.

412. *Fire protection.*—The plantations should be protected against fire by cleared lines 10 feet (3.05 metres) wide all round. The lines between adjacent plantations will be however limited to a width of 6 feet (1.83 metres).

413. *Closure to grazing.*—All plantations will be closed to grazing for a period of 6 years including the year of felling.

414. *Demarcation.*—The actual area of each of the plantation that is formed during the period of this plan should be found by actual survey of the planted area. The map of each plantation formed will be made on a scale of 16 inches to a mile (1 cm. = .396 kilometres) and posted in the Plantation Journal and the Control map so that it may be of use during the next revision of the plan.

SECTION 11—CONTROL.

415. A control journal, control book, plantation and nursery journals, record of works and control maps will be maintained for this working circle. The manner in which these forms are to be maintained are indicated in Sections K and L under the chapter on Miscellaneous Regulations.

CHAPTER III—WORKING PLAN FOR THE SELECTION WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

416.—*General constitution.*—The Selection Working Circle includes the mixed deciduous forests along the upper slopes of Bolampatti Blocks I and II Reserved Forests which are not covered by the Teak Conversion and Fuel Working Circles, and excludes drier areas containing an open and stunted crop without any appreciable quantity of exploitable timber, as well as steep and inaccessible areas. These areas were not exploited in the past and contain a fair quantity of Rosewood, *Vengai*, *Pillamarudu*, Venteak, Teak and other valuable timber species which would otherwise deteriorate or be pilfered if not exploited.

417. The working circle will exclude an area of 2,558 acres (1,035.20 hectares) of evergreen forests along the Varadimalai plateau of Bolampatti Block II Reserved Forest included for selection felling during the period of the past plan, as these forests are mostly situated on steep and inaccessible localities at an average elevation of 4,000 feet (1,219 metres) not conducive for economic exploitation. Owing to heavy winds at this high elevation, the trees are also mostly small sized except along banks of jungle streams. This small extent of evergreen forests will be preserved as they form the main catchment of the Noyilar an important source of irrigation in the plains below.

418. *Area.*—The total gross area of the working circle is 6,000 acres (2,428.14 hectares) of which the net area is 5,310 acres (2,148.90 hectares).

419. *Character of the vegetation.*—The forests included in this working circle are of the mixed deciduous type—of which the more prominent species are rosewood, *vengai*, teak, venteak and *pillamarudu*. Rosewood is the more predominant species in the Bolampatti Valley and occurs gregariously in patches like Pungancherry and Singapathy, where it attains large dimensions. Rosewood is comparatively rarer in the Walayar Valley slopes where the predominent species is teak, which often forms 90 per cent of the growing stock as in the Waterfall Block. Natural teak is seldom met in the Bolampatti Valley.

420. A fuller description of the forests is given in Chapter II of Part I.

SECTION 2—DIVISION OF THE AREA.

421. The area of the working circle is distributed over portions of the Waterfall, Thenkaradu, Konamalai, Kuthady, Iruttupallam, Sadivayal and Kallar Blocks. As the total area of the working circle is small, two felling series will be constituted as follows :—

Serial number and name of the felling series.	*Area in acres (hectares).*			
	Gross.		*Net.*	
1. Koochimalai Selection Felling series	3,500	(1,416·41)	3,104	(1,266·16)
2. Bolampatti Selection Felling series	2,500	(1,011·72)	2,206	(892·75)

SECTION 3—ANALYSIS AND VALUATION OF THE CROP.

422. The forests included in this working circle were subjected to a cent per cent enumeration by Van Haeften during the preparation of his plan in 1944, but were not prescribed by him for working as the number of trees above the 22 to 24 inches (55.88 to 60.96 centimetres) diameter class (which was fixed by him as the exploitable size) were considered not quite adequate to ensure systematic working on economic lines. Because of this and the general steepness of the country, it was finally decided that it would be inadvisable to do any work in this area quite soon. These presumptions do not hold good to the present day as the price of rosewood has increased enormously, and non-exploitation of this species by the department would only encourage illicit removals of this valuable species as happened in 1958. Moreover, the number of exploitable trees would be much more than expected by Van Haeften, as it is proposed to reduce the exploitable girth limit to 5 feet (1.52 metres) in the case of teak, since natural teak trees in the Bolampatti Range do not grow to large sizes.

423. As the areas have not been worked in the past, the enumeration figures of Van Haeften will be adopted, since there cannot be any large variation in the growing stock.

424. The details of the method of enumeration adopted, the results of enumeration and the total growing stock in each felling series calculated proportionately from the enumeration figures of Van Haeften will be found in Chapter VI of Part I.

SECTION 4—METHOD OF TREATMENT.

425. *Silvicultural System.*—The forests will be worked under the Selection System whereby only mature and overmature trees of merchantable species over a minimum prescribed girth limit will be removed, so as to increase the value of the growing stock in quality and quantity. The species that are suitable for extraction are rosewood, teak, *vengai*, *pillamarudu* and venteak. Present knowledge as to the rate of growth of the saleable species in the mixed deciduous forests and of the successful methods of regenerating them being apparently meagre, it is proposed to extract what is considered overmature, moribund, or deteriorating, by light selection felling, as quickly as possible with a safe girth limit calculated for an equal annual sustained yield.

426. Since it is observed that the natural regeneration of valuable species is not satisfactory in these mixed deciduous forests, it is necessary to evolve a cheap and satisfactory method of artificial regeneration of the more important timber species such as teak, rosewood and *Vengai*. Artificial regeneration in the gaps caused by felling will therefore be provided as an experimental measure to start with, for introduction on a regular scale later on, if found successful. As the area of the annual coupe is bound to be small, it is presumed that the regeneration works can be supervised adequately and checked from time to time.

427. *Choice of species.*—The common saleable species at present are teak, rosewood, *Vengai*, *Pillamarudu* and Venteak. If there is a demand for any other species, it may be also marked for felling if it is of the exploitable girth fixed in paragraph 428 below.

428. *Exploitable girth.*—A perambulation of the forests included in this working circle revealed that beyond a girth of 6 feet (1.83 metres), most of the trees of *Pillamarudu* and *Vengai* have a tendency to become unsound. This fact and the existence of a considerable quantity of overmature timber as revealed in the enumeration figures of Van Haeften, necessitate the adoption of a minimum girth of 6 feet (1.83 metres) at breast height for exploitation.

429. Stem analysis done on Venteak revealed that the age of maximum volume production, or the age at which the Mean Annual Increment culminates is not reached even at the age of 90 years when a diameter of 28.6 inches (72.6 centimetres) at breast height is reached. Although this would suggest the fixation of a minimum exploitable girth above this limit, it is seen that most of the trees of this species also tend to become unsound after they cross the 6 feet (1.83 metres) girth limit. Hence a minimum exploitable girth of 6 feet (1.83 metres) at breast height is fixed for this species also. The results of the stem analysis done have been tabulated in Chapter VI of Part I.

430. In contrast to Venteak, it is seen that trees of Rosewood do not get unsound or deteriorate even on attaining large sizes. Rosewood seems to be at home in the Bolampatti Valley and not infrequently specimens of large sizes are noticed. Stem analysis done on one Rosewood tree at Ittimarathupallam revealed that the Current Annual Increment for this species does not culminate even at the age of 80 years when an exploitable diameter of 28.4 inches (72.1 centimetres) at breast height is reached. An exploitable girth of 8 feet (2.44 metres) at breast height will be therefore empirically fixed for this species. The result of the stem analysis done have been tabulated in Chapter VI of Part I.

431. In the case of teak, an exploitable girth of 5 feet (1.52 metres) will be fixed, as natural teak trees of large sizes is the exception rather than the rule.

432. An exploitable girth of 6 feet (1.83 metres) over breast height is fixed empirically for any of the other miscellaneous species not specified in the list given in paragraph 427 that may be marketable as timber, if they happen to occur in the annual coupe and it is decided to exploit them.

433. *Number of exploitable trees.*—The distribution of the various timber species above the minimum exploitable girth limits fixed above as computed from the data furnished in paragraph 296 of Chapter VI of Paragraph I is given below for each of the two felling series—

1. *Koochimalai selection felling series.*

Serial number and name of species. (1)	*Total number of exploitable trees.* (2)
1. Rosewood	121
2. *Vengai*	934
3. Venteak	432
4. Teak	710
5. *Pillamarudu*	399
Total ..	2,596

2. *Bolampatti selection felling series.*

Serial number and name of species. (1)	Total number of exploitable item. (2)
1. Rosewood	86
2. *Vengai*	666
3. Venteak	308
4. Teak	506
5. *Pillamarudu*	284
Total	1,850

434. It will be seen from the data furnished in the preceding paragraph, that only one exploitable tree would be available in 1.3 acres (.52 hectare) of forest. As the trees occurring in this working circle are valuable (particularly the Rosewood) and are likely to be pilfered if not exploited departmentally, it is very necessary that they should be exploited.

435. *Rotation.*—In fixing up of the rotation for a selection forest it is necessary to know the age at which the minimum exploitable girth limits fixed for the various timber species in the locality are reached. With this end in view, stem analyses were done on two Rosewood trees and one tree of Venteak, the results of which are tabulated in Chapter VI of Part I. As both the trees of Rosewood on which the stem analyses were done were found to be below 83 years of age, it was not possible to calculate the age at which the exploitable girth at 8 feet (2.44 metres) fixed could be reached. From the trend of the diameter/age curves of tree No. 2 (aged 83 years), it is presumed that the exploitable girth of 8 feet (2.44 metres) may be reached at an age of 85 years. Venteak is seen to reach the exploitable girth of six feet (1.83 metres) at an age of 67 years. Of the other species, *Pillamarudu* has no rings and *Vengai* with its heavy exudation of dark gum made ring-counting impossible. Hence no such data could be gathered of these species for the locality. Teak of course has rings and would admirably lend itself for stem analysis, but good sound trees of above the exploitable girth of 5 feet (1.52 metres) not being available, this idea had to be therefore abandoned.

436. Presuming that it would take 120 years to reach the exploitable girth of 6 feet (1.83 metres) at breast height fixed for most of the miscellaneous species (*Pillamarudu* and *Vengai*) which form the bulk of the exploitable crop, the rotation is fixed at 120 years on a rather conservative estimate. The rotation is however only of theoretical interest, as the minimum exploitable girth limits fixed for each of the species will alone condition the actual working.

437. *Felling Cycle.*—Since it is silviculturally desirable to adopt a short felling cycle in order to remove the mature and over-mature stock in as short time as possible, a felling cycle of 20 years will be adopted.

438. *Regulation of the yield.*—As the forests included in this working circle are not normal, regulation of the yield based on formulae applicable to normal or nearly normal forests like the Von Mantel's formula or its modifications would be ill-advisable at this stage. Applications of other formulae like the French Method of 1883, or the Smythies Safe-guarding formula cannot be applied due to lack of necessary data on the rate of growth of the different species, and the percentage of unsound trees in each diameter class in the enumeration figures of Van Haeften. The yield will therefore be regulated by area, the area of the annual coupe being obtained by dividing the area of the felling series by the felling cycle. Since the coupes have been so constituted as to have natural features or roads and reserve lines as boundaries, the average area of the annual coupe cannot be adhered to strictly. The coupes are nearly equal. The layout of the coupe is shown on the concerned management maps.

SECTION 5—METHOD OF EXECUTING FELLINGS.

439. *Agency of exploitation.*—The marking, felling and extraction of timber will be done departmentally, as the timber involved is valuable.

440. *Marking Rules.*—The following rules will regulate the marking of trees for selection felling :—

(i) Only trees of Teak, Rosewood, *Vengai*, Venteak and *Pillamarudu* of and above the exploitable girth prescribed in paragraphs 428 to 432 alone shall be marked. If demand arises for any other species, the District Forest Officer may order trees of over 6 feet (1.83 metres) in girth of such species also to be included for marking.

(ii) No two trees within a chain distance from each other shall be marked provided that if two trees are close enough to form only one gap, both may be marked.

(iii) When trees of exploitable size are retained for silvicultural or other reasons, the better tree with vigorous growth and good shape will be retained and over-mature or badly shaped or moribund or diseased trees of exploitable size will be marked.

(iv) All dead, dying and fallen trees of saleable species irrespective of their girth will be marked for felling.

(v) Trees marked for felling should be serially numbered irrespective of the species and should have the numbers chiselled on them both at stump height and breast height so that after felling, the stump as well as the tree may be identified.

(vi) As these forests were not worked in the past, no data is available for the preparation of local volume tables. At the time of marking, the girth of the tree over bark at breast height and the estimated length of the merchantable bole will be noted. The probable volume of the out-turn will be obtained from any of the quarter-girth volume tables using an average form factor of 0.6.

(vii) The District Forest Officer or his Gazetted Assistant must check at least 10 per cent of the marking.

(viii) The marking and enumeration should be completed normally by December of the year previous to felling and the estimate of yield prepared in the following January so that estimates can be sanctioned and enumeration checked before felling starts on 1st April.

441. *Extraction scheme.*—An extraction scheme should be drawn up for the coupe at the time of marking showing the location of convenient drag-paths and cart-tracks, on a map drawn to the scale of 16 inches to a mile (1 centimetre—.0396 kilometre). The extraction plan should be approved by the District Forest Officer.

442. *Period of working.*—The period of working each coupe is one year commencing from the 1st of April of the allotted year. The felling will commence early in April and completed as quickly as possible.

443. *Felling.*—The trees should be felled close to the ground with as little wastage as possible. The direction of fall should be on the up hill side in order to minimise damage.

444. *Logging.*—The felled trees will be converted into logs. This operation must be done with the minimum of wastage under the personal supervision of the Section Forester and must be frequently checked by the Range Officer and the District Forest Officer or his Assistant. As far as possible, longer lengths should be aimed at as they have a greater

demand in the market. Only defective logs should be rough squarred with a view to eliminate the defects as far as possible. Exceptionally large logs may sometimes have to be halved with the saw to facilitate dragging and transport. In such cases care should be however taken to ensure that the saw cut is made 1½ inches (3.8 centimetres) to 2 inches (5 centimetres) away from the centre heart, as exposure of the heart almost invariably results in bad splitting of both halves.

445. *Dressing.*—Logs above 25 cubic feet (0.7 cubic metre) in volume may require drag holes and snouting. But attempts should be made to use ' sister hooks ' for dragging, which will eliminate the wastage of timber due to drag holes.

446. Logs of Rosewood will be dressed alround by chipping off all bark and sapwood so as to expose the colour of the heartwood.

447. Debarking of logs of Venteak will not be done, in order to minimise splitting.

448. In all round logs the bark will be removed at the middle of the log to a width of 2 to 3 inches (5 to 7.6 centimetres) in the form of a ring so as to enable the mid-girth to be measured under bark.

449. *Classification.*—The trees converted into logs will be classified and graded as per the system adopted in the Coimbatore South Forest Division. The classification will be as follows :—

Quality classification—

' A '—Logs without knots, cracks, splits, etc.

' B '—Logs with slight defects such as bends, knots, etc.

' C '—Poor quality logs.

Length and girth classification (for Teak and Rosewood only)—

' AL I '—A class logs over 15 feet (4.57 metres) in length and 60 inches (152.4 centimetres) and over in girth.

' AL II '—A class logs over 15 feet (4.57 metres) in length and 48 to 59 inches (121.9 to 149.8 centimetres) in girth.

' AL III '—A class logs over 15 feet (4.57 metres) in length and 36 to 47 inches (91.4 to 119.4 centimetres) in girth.

' AS I '—A class logs 8 to 15 feet (2.44 to 4.47 metres) in length and 60 inches (152.4 centimetres) and over in girth.

' ASII '—A class logs 8 to 15 feet (2.44 to 4.57 metres) in length and 48 to 59 inches (121.9 to 149.8 centimetres) in girth.

' AS III '—A class logs 8 to 15 feet (2.44 to 4.57 metres) in length and 36 to 47 inches (91.4 to 119.4 centimetres) in girth.

' B I '—B class logs over 60 inches (152.4 centimetres) in girth.

' B II '—B class logs 48 to 59 inches (121.9 to 149.8 centimetres) in girth.

' B III '—B class logs 36 to 47 inches (91.4 to 119.4 centimetres) in girth.

'C I'—C class logs of 60 inches (152.4 centimetres) and over in girth.

'C II'—C class logs of 48 inches (121.9 centimetres) to 59 inches (149.8 centimetres) in girth.

'C III'—C class logs of 36 to 47 inches (91.4 to 119.4 centimetres) in girth.

NOTE.—Length is not taken into consideration in the case of B and C class logs, but all logs below 8 feet (2·44 metres) in length irrespective of the quality will be included in the C class.

450. All teak logs below 36 inches (91.4 centimetres) in girth will be classified as 'C IV' irrespective of quality or length.

451. Rosewood timber will be classified in the same way as for teak, except for the fact that logs above 72 inches (182.82 centimetres) in girth and 8 feet (2.44 metres) and over in length if sound and without defects will be treated as "shipment quality".

Classification of species other than teak and rosewood—

'A I'—A class logs of over 60 inches (152.4 centimetres) in girth.

'A II'—A class logs of 48 to 59 inches (121.9 to 149.8 centimetres) in girth.

Logs below 48 inches (121.9 centimetres) in girth are included in the B class.

NOTE.—Length is not taken into consideration in the classification of miscellaneous species.

452. *Numbering of logs.*—All logs will be chisel numbered on conversion. The year of felling, coupe number, species, tree number (which must be the same as enumeration number), and log letter (A, B, C, etc., for the butt, second and third logs respectively) will be chiselled on each log. The portion of longitudinally sawn logs will be given numbers after the log letter.

453. *Dragging.*—The converted timber will be dragged by means of departmental elephants if available to the forest or road side depot which will be maintained at a suitable road-head. In order to arrange the dragging economically as well as to avoid as far as possible up hill dragging, it may be necessary to have more than one forest depot.

454. There are no departmentally trained elephants now stationed within the Bolampatti Range. It is therefore suggested that a couple of elephants may be got from Tunacadavu Range at the time of exploitation and stationed at a suitable camp wherever facilities for watering and camping exist.

455. *Transport to Central Depot.*—The Central Depot for sale of timber will be at the range compound at Iruttupallam for the Bolampatti series for which there is adequate space. For this purpose, permission to use this space as a depot by the Kerala State Department will not be granted with effect from 1st April 1962. For the Koochimalai series the Central Depot will be located at Sholakarai in any *patta* that may be acquired for the purpose. The transport of timber from the forest depots to the Central Depot will be done by motor lorry. Tenders will be called for transport contracts from lorry owners and the lowest rate chosen.

456. Forest Code Forms 3, 4 and 5 will be maintained as usual for timber fellings, and depots inspected and the books checked, as prescribed in the Forest Code.

457. All roadside depots and central depot should be specially fire-protected by clearing and burning a 25 feet (7.62 metres) fire line around them and ensuring that this fire line is swept clean of all growth once a month in March, April and May.

SECTION 6—TABULAR STATEMENT OF FELLINGS.

458. The coupes to be worked during the period of this plan, the years in which they would be exploited and the areas of the individual coupes are shown in the following statement :—

Year of working.	Coupe number.	Area of the coupe in acres (hectares).			
		Koochimalai series.		Bolampatti series.	
		Gross area.	Net area.	Gross area.	Net area.
(1)	(2)	(3)	(4)	(5)	(6)
1962–63	I	185 (74·86)	155 (62·72)	132 (53·42)	90 (36·42)
1963–64	II	185 (74·86)	153 (61·91)	120 (48·56)	92 (37·23)
1964–65	III	180 (72·84)	149 (60·03)	100 (40·47)	70 (28·33)
1965–66	IV	175 (70·82)	150 (60·70)	104 (42·09)	54 (21·58)
1966–67	V	175 (70·82)	151 (61·10)	122 (49·37)	101 (40·87)
1967–68	VI	176 (71·12)	152 (61·51)	148 (59·90)	127 (51·39)
1968–69	VII	180 (72·54)	152 (61·51)	120 (48·56)	99 (40·06)
1969–70	VIII	188 (76·08)	164 (66·37)	120 (48·56)	92 (37·23)
1970–71	IX	180 (72·84)	152 (61·51)	129 (52·20)	124 (50·18)
1971–72	X	188 (76·08)	162 (65·56)	113 (45·73)	105 (42·49)

459. The coupes to be worked in the succeeding five years in case the revision of the plan is not undertaken in time, are indicated below :—

Year of working.	Coupe number.	Area of the coupe in acres (hectares).			
		Koochimalai series.		Bolampatti series.	
		Gross area.	Net area.	Gross area.	Net area.
(1)	(2)	(3)	(4)	(5)	(6)
1972–73	XI	188 (76·08)	173 (70·01)	113 (45·73)	93 (37·63)
1973–74	XII	175 (70·82)	155 (62·72)	113 (45·73)	113 (45·73)
1974–75	XIII	180 (72·84)	180 (72·84)	140 (56·66)	140 (56·66)
1975–76	XIV	160 (64·75)	160 (64·75)	144 (58·28)	144 (58·28)
1976–77	XV	160 (64·75)	160 (64·75)	140 (56·66)	120 (48·56)

SECTION 7—REGULATION OF REGENERATION OPERATIONS.

460. *Necessity for regenration.*—It is evident that natural regeneration of valuable species such as Teak, Rosewood and *Vengai* is very scanty in the forest included in this working circle and if mere exploitaton is undertaken without providing for assured regeneration, the forests are bound to deteriorate. In view of the inadequacy of natural regeneration of the more valuable species, it is essential to carry out some artificial methods to prevent the deterioration of the forest and to increase the proportion of the more valuable species. The proper technique of regenerating the mixed deciduous forests has not yet been evolved and hence artificial regeneration in the gaps caused by felling will be provided as an experimental measure to start with, to be carried on a regular scale later on if found successful. As the area of the annual coupe is small, it is considered that adequate supervision and check over the regeneration spot can be maintained. The work will be reviewed by the Conservator of Forests at the end of 3 years and if successful alone will be prescribed for continuation during the remaining years of the working plan.

461. It must be remembered that a certain amount of natural regeneration would occur naturally in the forests and also result spontaneously in the gaps caused by felling, and artificial regeneration methods adopted will be only to supplement the existing natural regeneration. Hence subsidiary silvicultural operations will be done in every year's coupe to assist the natural regeneration.

462. *Selection of gaps for regeneration.*—The gaps created by the fellings will be numbered, measured and enumerated for natural seedlings, by the Forester in charge of fellings and conversion, when he passes the converted timber. He will submit to the District Forest Officer through the Range Officer, a list showing the serial number of the gap, the size of the opening in the canopy as given by the maximum and minimum diameters, and the number of established regeneration and advance growth of Rosewood, Teak, *Vengai* and other valuable species within the gap. The serial number of a gap, which will be the number on the stump of the tree felled in it, should be painted in tar on a prominent blaze or a wooden sign board nailed on a tree. Regeneration will be considered as established if between 9 inches (22.8 centimetres) and 2½ feet (0.76 metres) in height, and advance growth will be all growth above 2½ feet (0.76 metres) in height and below about 20 inches (50.8 centimetres) in girth. This list will form part of the regeneration ledger and should be accompanied by the extraction map on which the location and numbers of the marked trees already exhibited would show the location and numbers of the gaps except for such of the marked trees as have not been felled for any reason. Trees marked but not felled should be shown distinctively in red.

463. Not less than 25 per cent of the gaps in each coupe should be inspected by the Range Officer, and not less than 10 per cent by the District Forest Officer or his Gazetted Assistant, in order to check the data furnished by the Forester.

464. The District Forest Officer shall provide for the regeneration of all gaps except those below the minimum size of 175 square yards (133.53 square metres) referred to below, unless he is satisfied from the figures supplied, that there is already ample established natural regeneration of the more valuable species.

465. To define exactly what is ample regeneration is not possible. But speaking generally, a gap may be considered to be sufficiently stocked if it contains, say 8 to 10 established seedlings.

466. The average size of a gap is less than one chain by half a chain and the smallest area less than half a chain by half a chain. The minimum size of a gap suitable for artificial regeneration is fixed at 175 square yards (133.53 squre metres) provided the width is not less than 10 yards (9.14 metres).

467. It is estimated that about 75 per cent of the total number of gaps in a coupe may normally require to be artificially regenerated.

468. *Preparation of the planting site.*—The felling refuse and weeds should be cleared, collected in heaps, dried and burnt, taking care to see that the advance growth is not burnt. A slight scorching of any of the seedlings will not matter as they can be cut back to coppice again. Almost all the valuable deciduous species occurring in the locality are known to coppice.

469. The gaps should be staked at an espacement of 6 feet (1.83 metres by 1.83 metres) with 2 feet (0.61 metre) high stakes. This work should be completed by the end of April at the latest.

470. *Planting.*—The pre-monsoon showers are likely to occur late in May and planting must be done as soon as the ground gets soft enough to allow penetration of crow-bar holes. One year old stumps of Teak, Rosewood and *Vengai* about 10 inches

(25.4 centimetres) long, with 9 inches (22.86 centimetres) of root and 1 inch (2.54 centimetres) of shoot, and 0.4 to 0.8 inches (1 to 2 centimetres) thick at the collar prepared from nursery raised seedlings will be planted firmly in crow-bar holes flush with the ground level. Teak, rosewood and *Vengai* are the most valuable of all deciduous species occurring in the locality and will be therefore chosen for planting.

Section 8—Nursery.

471. Nurseries will be required for raising stumps of teak, rosewood and *Vengai.* The nursery technique will be the same as detailed under the Teak Conversion Working Circle.

Section 9—Subsidiary Silvicultural Operations.

472. The main objects of the subsidiary silvicultural operations are :—

(1) to assist and establish regeneration (both natural and artificial) in the openings caused by the fellings;

(2) to tend the advance growth of valuable species present in unfelled portions of the coupe.

Tending of regeneration in gaps.

473. (*a*) *First year.*—Casualties in the first year will be replaced during the north-east monsoon showers. Three weedings will be carried out, one in July, a second in September and a third early in January. This will consist of climber cutting and uprootal of all weeds and rank undergrowth. Lateral shade inhibiting the growth of the plants and protruding climbers and stragglers will be cleared.

474. It must be remembered that a certain amount of natural regeneration of the valuable species will be present in all the gaps and tending operations to farm their growth should be done simultaneously as for the plants artificially put.

475. (*b*) *Second year.*—During the second year, the gaps that show a minimum survival of 75 per cent may be considered to have been sucessfully regenerated. If casualties are heavier than this, they should be made good in the manner prescribed for primary regeneration.

476. A weeding and clearing will be done along with the replacement of casualties early in the monsoon and a similar final tending at the end of the second monsoon.

477. It is anticipated that no further tendings will be necessary; but since our knowledge of regeneration in selection forests is very limited, the State Silviculturist should be consulted wherever necessary and the orders of the Conservator obtained.

478. *Tending of natural regeneration in the unfelled portions of the annual coupe.*—Natural regeneration of valuable species occurs in considerable quantities all over the forest and in all stages of development. It would be desirable to tend such regeneration over the whole coupe every year, but in the present state of our knowledge about the silvicultural needs of a mixed forest, the difficulties in supervision and the high cost incurred, this is not considered possible. However, the marking officer who has to go over the whole coupe, can at a small extra cost and a little more time than is required for marking, shall carry out the tending of the natural regeneration of valuable species over the annual coupe of the year to such an extent as is possible during the course of the marking operations. For this purpose, he shall take with him 2 or 3 extra mazdoors whose work will be :—

(1) Freeing from suppression advance growth of valuable species.

(2) Cutting back malformed or broken stems of valuable species.

(3) Climber cutting.

(4) Reduction in the number of coppice shoots of saleable timber species to one or two stems per stool depending on the size of the coppice shoots.

479. In the course of tending, Teak and Rosewood should be given preference over all the other species.

480. The tending operations should be checked by the District Forest Officer or his Gazetted Assistant at the time of checking the enumeration.

SECTION 10—OTHER REGULATIONS.

481. *Closure to grazing.*—The regenerated coupes will be closed to grazing for a period of 5 years including the year of regeneration. The method of closure to be adopted is indicated in Chapter VII of Part II.

482. *Demarcation of coupe boundaries.*—The coupe boundaries should be kept clear annually by lines 10 feet (3.05 metres) wide. These will serve as the plantation boundaries too.

483. The coupe numbers, years of working and regeneration should be indicated on stone slabs planted in the salient corners of the coupe.

SECTION 11—CONTROL.

484. A control book, record of works, nursery and plantation ledger, control map and control journal will be maintained for this working circle. The manner in which these records are to be maintained is detailed in Sections K and L of Chapter VIII.

CHAPTER IV—WORKING PLAN FOR THE FUEL WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

485. *General constitution.*—The Fuel Working Circle extends over both the Walayar and Bolampatti valleys. In the Walayar valley all the forests on the plains constituting the Sholakarai Block and the accessible lower southern slopes west of the Ayyaswami South Block extending up to the inter-state boundary along the Walayar river, have been included in the working circle.

486. In the Bolampatti valley, the lower northern slopes of the Bolampatti Blocks I and II Reserve Forests to the west of the Konamalai valley up to Adivaram, and thence extending northwards in a horse-shoe shaped manner up to Valakaradu, have been included in this working circle.

487. In general, this working circle includes the areas included under the Fuel Plantation Working Circle and the Fuel Working Circle of the previous plans, except for the following changes. The Marudamalai Series and portions of the Chavadi and Narasapuram Series have been excluded due to paucity of growth. In the lower foot-hills of the Bolampatti valley forming the Singapathy and Sadivayal Blocks such of those areas which have been either already converted into teak and softwood plantations or proposed for conversion at a later date, have also been excluded from the working circle. In addition, certain areas in localised bits considered unfit for exploitation owing to paucity of growth, or due to the steep unworkable nature of the terrain have also been excluded. The upper limits of the old working circle boundary have been raised to such higher levels as could be profitably worked without detriment to the soil, owing to the present improved extraction methods and facilities.

488. The area of this working circle is 11,681 acres (4,727.18 hectares).

489. *Character of the vegetation*.—The character of the vegetation varies considerably with the locality as may be expected in the case of a working circle which includes areas in both the valleys dealt with. The main type is ' mixed deciduous ', which degenerates into thorny scrub as one proceeds eastwards in the same valley, or progresses northwards from valley to valley. The best quality is found at the western end of the southern and northern lower slopes of the southernmost range of hills.

490. A fuller description of the sub-types of forests which occur has been given under Chapter II of Part I.

SECTION 2—DIVISION OF THE AREA.

491. The area covered by this working circle has been divided into seven felling series, so as to distribute the centres of working and reduce the unit of felling to a manageable extent, while at the same time stimulating competition among the probable bidders.

492. The division into felling series has been made as far as possible to avoid the felling of immature crops, but with a view to meet the fuel and small timber requirements of the local population to the extent possible.

493. The following statement shows the constitution of the felling series :—

Serial number. (1)	*Name of the felling series.* (2)	*Area in acres* (3)	*(hectares)* (4)
1	Waterfall	1,318	(533·39)
2	Thenkaradu	1,629	(659·23)
3	Chavadi	877	(354·91)
4	Mangalapalayam	1,826	(738·96)
5	Iruttupallam	2,410	(975·30)
6	Poondi	2,048	(828·81)
7	Narasapuram	1.573	(636·57)

494. The areas included under all the felling series have been shown in the accompanying management maps.

495. Practically all the series enlisted above were already in existence during the previous plan except that they have now been reconstituted by transfer of areas. The Walayar Series and the Thenkaradu Series have been reconstituted as the Waterfall Series and the Thenkaradu Series respectively, since the major portion of the Walayar Series lying west of the Walayar river now forms part of the Kerala State. The Poondi and Kallar Series have been merged together as they are too small. Changes in the areas of the remaining series too have been made.

SECTION 3—ANALYSIS AND VALUATION OF THE CROP.

496. All the fuel series have been stock-mapped ocularly so as to exhibit the probable outturn of firewood in tons per acre. Only such areas as are capable of yielding fuel on exploitation are included in this working circle. The stock maps prepared have been appended to this plan.

SECTION 4—METHOD OF TREATMENT.

497. *Silvicultural System*.—The ' simple coppice ' system in force will be continued as it has been found to satisfy the objects of management. But all sandal (*Santalum album*), Tamarind (*Tamarindus indica*), *Kadukkai* (*Terminalia chebula*, neem (*Azadi-*

rachta indica), Wood apple (*Feronia elephantum*), Soapnut (*Sapindus emarginatus*), *Pungam* (*Pongamia pinnata*), *Iluppai* (*Madhuca latifolia*) and *Poola* (*Salmalia malabarica*), will be treated as 'Reserved species' and shall not be felled when they occur inside the coupes, in accordance with the present policy of the Government. The retention of these species is prescribed because they are not regular fuel-yielding species, and their value as minor forest produce yielding trees is much greater than their value.

498. Artificial regeneration in the felled coupes is prescribed in areas wherever suitable, as regeneration by coppice as well as by plants of seedling origin is sparse and is not sufficient to reclothe the area. Moreover, in some of the better series like the Waterfall, Thenkaradu and Iruttupallam Series which receive rainfall of not less than 100 centimetres per year, artificial introduction of a few timber species is considered desirable in order to increase the proportion of valuable species in the growing stock, while at the same time meeting the small timber demands of the local populace during the next rotation. It will be therefore prescribed that not less than one-third of the felled coupe shall be regenerated artificially.

499. *Choice of species.*—The species used in regenerating these forests after clear-felling will be teak, *Vengai* (*Pterocarpus marsupium*), *Vagai* (*Albizzia lebbek*), *Velvagai* (*Albizzia Procera*), *Karuvagai* (*Albizzia odoratissima*), tamarind (*Tamarindus indica*), neem (*Azadirachta indica*) and *Parambai* (*Acacia ferruginea*). In the Chavadi and Narasapuram Series where conditions are very dry, teak, *Vengai* (*Pterocarpus marsupium*) and *Karuvagai* (*Albizzia odoratissima*) will not be tried, as they are not likely to succeed. In the other series where conditions are moister, only the more valuable species like teak, *Vengai* (*Pterocarpus marsupium*), tamarind (*Tamarindus indica*) and *Karuvagai* (*Albizzia odoratissima*) should be preferred.

500. *Rotation.*—The rotation for any fuel forest should be fixed at the age at which the rate of volume production is the maximum giving due regard to silvicultural considerations, taking care to see (1) that there is no fall in the price increment, (2) that the local demand for firewood is met by supplying the sizes readily absorbed by the market and most favoured by the consumers; and (3) that sufficient allowance is made in fixing the rotation for the development of a few useful timber species to develop into small timber sizes.

501. With this end in view, attempts were made to record the girth measurements at breath-height of coppice shoots in half acre plots selected at random in felled fuel coupes of the predominant fuel species, and the data thus collected utilized to determine the age at which the volume production is maximum. In other words, the Mean Annual Increment is equal to the Current Annual Increment. Unfortunately, however, sufficient data could not be collected as control records for areas worked prior to 1943 are mostly not available, and the areas themselves are not recognizable in the field as no coupe stores seem to have been planted. This idea had to be therefore abandoned. The rotation will be therefore fixed at 30 years for the Chavadi, Mangalapalayam, Poondi and Narasapuram Series as adopted in the previous plans. For the Thenkaradu and Iruttupallam Series, a rotation of 40 years will be adopted, as the forests included in this series consist of a good admixture of small timber yielding species. A higher rotation is advocated so that these trees could reach small timber dimensions.

502. *Regulation of the yield.*—The yield will be regulated by area. In each felling series, therefore, the size of the annual coupe is obtained by dividing the total area by the period of the rotation. In the layout of the annual coupe, natural features have been followed as far as possible.

SECTION 5—METHOD OF EXECUTING FELLINGS.

503. *The annual coupe and its layout.*—The annual coupe will be demarcated on the ground in accordance with the felling series map, by cut lines 6 feet (1.83 metres) wide, except where the boundary is already well defined by natural features. It should be

borne in mind that the area of the coupe as shown on the management map is of more importance than the actual shape of the coupe. The correct area of the coupe will be computed on the basis of actual survey which must be done by an Officer not below the rank of a Forester, but should be countersigned by the Range Officer who will certify to the correctness of the survey after checking. The importance of the District Forest Officer or his Assistant checking personally at least two coupes in the range is emphasised as inaccurate surveys may involve loss of revenue to the Government. Any small difference between the actual area of the coupe and its nominal area as shown in the felling series map will not involve a deviation requiring sanction, so long as the difference does not exceed 5 per cent of the nominal area.

504. While carrying out the survey and demarcation of the fuel coupes, trees on the outer periphery of the forest in the adjoining portions not to be felled should be ring-marked at breast height and serially numbered with red paint at breast height as well as at the base. A list showing the number, species, girth at breast height (overbark) and location (whether north, south, east or western boundary), will form part of the lease agreement. This will prevent to a great extent any surreptitious extension of coupe limits by contractors.

505. *Division into strips.*—Each coupe will be divided into strips. Coupes below 50 acres (20.23 hectares) in extent will be divided into two strips, while coupes above 50 acres (20.23 hectares) will be divided into three stripes. The strip lines will be cut by lines 3 feet (0.91 metres) wide.

506. The sequence in which the three strips are to be worked will be left to the discretion of the District Forest Officer. In order to facilitate regeneration without any great time lag after the felling, the District Forest Officer will mark the last strip in such fashion, that this strip will be the area to be regenerated during the next year. This will to a great extent prevent the cost of clearing lines and facilitate execution of the work more easily.

507. The cut materials obtained while cutting the coupe and strip lines will be sold in auction separately before the coupe sale.

508. All annual coupe surveys shall be completed by the Range Officer, and the field book submitted to the District Forest Officer by the end of October of the year previous to that in which the coupe is to be sold.

509. *Agency of exploitation.*—The fellings will be conducted through the agency of contractors as the system has been established and found to be satisfactory.

510. *Period of lease.*—The coupes will be put up for sale in January or early in February so as to provide time for re-sale by auction or by tender if the prices obtained as the first sale are not satisfactory. The coupe will be conveyed to the lessee on 1st April, with a *voidah* of 6 months for coupes below 20 acres (8.09 hectares) in extent, and 9 months for coupes with an extent of 50 acres (20.23 hectares) or more which will commence from the 1st of April. Irrespective of the date of sale or delay in conveying the coupe to the lessee, no extension of *voidah* should be ordinarily granted. The Range Officer should ensure by frequent inspection that the work is carried out as per conditions of sale, and the progress of work is sufficient to complete the removals by the end of the period of contract.

511. *Coupe arrears.*—In the event of any coupe remaining unsold or portions of coupe remaining unfelled within the lease period in any particular year, such portions will be sold in the subsequent year with such *voidah* as the District Forest Officer deems necessary, unless he is satisfied that the area is not economically exploitable. In the latter event, the District Forest Officer will record the facts in the control journal and make suitable entries on the control map.

512. *Reserved species.*—All sandal (*Santalum album*), *Tamarind* (*Tamarindus indica*), *Kadukkai* (*Permindali chebua*), *Neem* (*Azadirachta indica*), *Punnai* (*Colophyllum inophyllum*) *Wood apple* (*Feronia elephantum*), *Soapnut* (*Sapindus emarginatus*), *Pungam* (*Pongamia pinnata*), *Iluppai* (*Medhuca latifolia*) and *Poola* (*Salmalia malabarica*) occurring in the annual coupe will be 'reserved' and shall not be felled under any circumstances by the coupe contractor. All the reserved trees will be marked and numbered with white paint before the coupe is offered for sale, and a list showing the number of the trees, the species, and its girth will form part of the lease agreement. It may however be possible that smaller saplings and seedlings of reserved species may not permit of such marking and numbering. The absence of any such marks or numbers, however, does not entitle the lessee to fell such prohibited trees.

513. *Felling and extraction rules.*—(1) The coupes should be felled in a systematic manner, strip by strip. A new strip may be entered into only after the Range Officer has personally satisfied himself that the work in the previous one has been satisfactorily completed.

(2) All reserved trees mentioned in paragraph 512 shall not be felled by the contractor, except such old or unsound trees as have been expressly authorised to be felled by the District Forest Officer. Excepting for the reserved species mentioned above, the contractor should clearfell all shrubs, trees and climbers even if the species is not required by him or otherwise the proportion of unwanted species like *Euphorbias*, *Indu* (*Acacia intsia*), *Mulkiluvai* (*Commiphora berryi*), *Thanuku* (*Cochlospermum religiosum*), *Malankiluvai* (*Protium candatum*), *Porapachalai* (*Dalbergia pannulata*), *Thanaku* (*Gyrocarpus jacquini*), *Vandalai* (*Givotia rottleriformis*), etc., will increase to the detriment of the more valuable species.

(3) No tree growth within one claim on either side of perennial or semi-perennial stream or streams within or along the boundraies of the coupe should be felled. Such streams if any will be clearly marked on the surveyed sketch of each coupe attached to the sale list. The area of one chain on each side thus marked will however not be excluded from the total area of the coupe.

(4) Everything the contractor cuts shall be cut clearly with sharp axes or bill-hooks as close to the ground as possible in any case within 6 inches (15.24 centimetres), from the ground level in such a manner that the bark is not separated from the wood. No trimming of the stools is necessary.

(5) Sawing will be prohibited, except for felling trees or for billeting them into transportable sizes.

(6) Bamboos found inside the fuel coupe will be the property of the fuel coupe contractor: they will be felled by him in accordance with the felling rules for bamboos. The District Forest Officer will accordingly insert the necessary conditions to the agreement.

(7) The contractor will stack all cut firewood into stacks 5 feet by 5 feet by 3 feet (1.52 metres by 1.52 metres by 0.91 metres) prior to removal.

(8) If the contractor is desirous to remove any tree from his coupe in the shape of timber or poles, he should get them hammer-marked by the beat-guard at stump site before removal.

(9) The contractor may construct at any time cart-tracks in any part of the coupe strip he may be working in. He will make only the maximum number of earth slides that are absolutely necessary for the extraction of firewood from the upper slopes.

(10) All the operations in the coupe shall be undertaken only by the mazdoors of the contractors; either he or his authorised agent shall be present to supervise the work.

(11) No charcoal burning will be allowed under any circumstances in any fuel coupe or any part of the Reserved Forest, as it is detrimental to forest growth.

514. *Supply of agricultural implements.*—The contractor shall at all times during the period of his contract sell to ryots on demand for their bona fide domestic and agricultural purposes all kinds of produce in the coupe at rates to be fixed by the District Forest Officer in consultation with the Collector.

515. The contractor shall also be bound to supply to the members of the Jaggery Co-operative Societies on demand, brush wood such as thorns and twigs of 6 inches (15.2 centimetres) and below in girth at such rates per head load that may be fixed by the District Forest Officer in consultation with the Collector.

SECTION 6—TABULAR STATEMENT OF FELLINGS.

516. The following statements show the coupes to be worked annually during the next ten years in each of the felling series included in the Fuel Working Circle.

Name of felling series.

Year of working.	Coupe No.	Thenkaradu. Area in acres (hectares).	Chavadi. Area in acres (hectares).	Mangalapalayam. Area in acres (hectares).	Narasapuram. Area in acres (hectares).
1962—63	I	42 (17·00)	31 (12·54)	62 (25·09)	52 (21·04)
1963—64	II	42 (17·00)	30 (12·14)	60 (24·28)	53 (21·44)
1964—65	III	41 (16·59)	31 (12·54)	62 (25·09)	52 (21·04)
1965—66	IV	41 (16·59)	30 (12·14)	62 (25·09)	54 (21·85)
1966—67	V	41 (16·59)	30 (12·14)	60 (24·28)	52 (21·04)
1967—68	VI	41 (16·59)	30 (12·54)	61 (24·68)	52 (21·04)
1968—69	VII	42 (17·30)	31 (12·54)	61 (24·68)	52 (21·04)
1969—70	VIII	43 (17·40)	29 (11.33)	60 (24·28)	54 (21·85)
1970—71	IX	42 (17·00)	29 (11.33)	60 (24·28)	54 (21·85)
1971—72	X	44 (17·81)	29 (11.33)	60 (24·28)	53 (21·44)

Year of working.	Iruttupallam Series Coupe No.	Iruttupallam Series area in acres (hectares).	Poondi Series Coupe No.	Poondi Series area in acres (hectares.)	Waterfall Series Coupe No.	Waterfall Series area in acres (hectares.)
1962—63	NO AREA WORKED.		I	78 (31·57)	I	34 (13·76)
1963—64	I	60 (24·28)	II	68 (27·52)	II	34 (13·76)
1964—65	II	62 (25·09)	III	68 (27·52)	III	32 (12.95)
1965—66	III	60 (24·28)	IV	68 (27·52)	IV	34 (13·76)
1966—67	IV	61 (24·68)	V	66 (26·71)	V	32 (12·95)
1967—68	V	61 (24·68)	VI	68 (27·52)	VI	32 (12·95)
1968—69	VI	61 (24·68)	VII	68 (27·52)	VII	34 (13·76)
1969—70	VII	60 (24·28)	VIII	68 (27·52)	VIII	32 (12·95)
1970—71	VIII	60 (24·28)	IX	68 (27·52)	IX	32 (12·95)
1971—72	IX	60 (24·28)	X	68 (27·52)	X	32 (12·95)

517. The coupes to be worked in the succeeding five years in case the rivision of the plan is not undertaken in time are indicated below :

		Thenkaradu.	Chavadi.	Mangalapalayam.	Narasapuram.
1972—73	XI	42 (17.00)	31 (12.54)	61 (24.68)	52 (21.04)
1973—74	XII	40 (16.19)	29 (11.33)	62 (25.09)	52 (21.04)
1974—75	XIII	42 (17·00)	31 (12·54)	60 (24·28)	52 (21·04)
1975—76	XIV	40 (16·19)	30 (12·14)	62 (25·09)	51 (20·63)
1976—77	XV	40 (16·19)	28 (11·33)	62 (25·09)	52 (21·04)

	Iruttupallam.		Poondi.		Waterfall.	
1972—73	X	62 (25·09)	XI	68 (27·52)	XI	32 (12·95)
1973—74	XI	61 (24·68)	XII	68 (27·52)	XII	32 (12·95)
1974—75	XII	63 (25·09)	XIII	68 (27·52)	XIII	34 (13·76)
1975—76	XIII	61 (24·68)	XIV	68 (27·52)	XIV	34 (13·76)
1976—77	XIV	62 (25·09)	XV	68 (27·52)	XV	34 (13·76)
1977—78	XV	60 (24.28)				

SECTION 7—REGULATION OF REGENERATION OPERATIONS.

518. *Necessity for artificial regeneration.*—The forests included in this working circle are generally understocked. It is also noticed that fuel forests worked under the coppice systems gradually deteriorate because of progressive increase in the mortality percentage of stools in successive rotations and also because during exploitation all the useless species such as *Malankiluvai* (*Protium caudatum*), *Porapachalai* (*Dalbergia panicalata*, *Mulikikilupai* (*Commiphoxa berryi*), *Euphorbias*, *Lantana* and *Indu* (*Acacia intsia*) have been left unfelled in the past, with the result that for every rotation there is an increase of these useless species. All these facts certainly indicate the necessity for undertaking artificial regeneration in felled fuel coupes in order to halt further deterioration of these forests and to augment the yield from them. Moreover, in some of the better series like the Waterfall, Thenkaradu and Iruttupallam Series which receive an annual rainfall of more than 100 centimetres per year, artificial introduction of a few timber species that could grow to small timber dimensions for the next rotation is considered desirable. This will incidentally increase the value of the growing stock and also go to a certain extent in meeting the demands of the local public in respect of their requirements of small timber.

519. *Method of Regeneration.*—The areas covered by the fuel series receive only a low rainfall and hence some water-conservation technique is absolutely necessary. The technique adopted will be the ' saucer ' method in flat or nearly flat areas as in portions of the Thenkaradu Series and the ' trench and mound ' technique for sloping country.

520. *Preparation of the planting site*—(*a*) *Saucer method.*—Soon after the contractor vacates the last strip, planting lines 16½ feet (5·03 metres) apart wil be aligned, and coppice growth to a width of 6 feet (1·83 metres) on either side of the aligned line will be cut and preferably uprooted. While clearing the lines, coppice shoots of useful fuel species should be retained and only clearing of useless coppice and weed growth resorted to, as it is expected that the coppice would form a valuable proportion of the future crop.

Along each planting line, staking at 16½ feet (5·03 metres) will be done to obtain an espacement of 16½ feet by 16½ feet 5·03 metres by 5·03 metres). If the stake falls exactly where an active stool is situated, the stake should be shifted a few feet either way instead of destroying the stool. In doing so, espacement need not be rigidly adhered to, as the ultimate object of artificial regeneration is to only supplement the existing natural coppice and not to replace it altogether. At each stake, pits 1 foot (0·31 metre) cube will be dug, and the dug out soil allowed to weather for atleast one month. The clearing of the lines and the pitting should be completed by the end of April. By the end of May, the pits should be refilled, and saucers will be made around each pit as shown in figures 1 and 2 :

PLAN OF PLANTING.

Pits 1 foot by 1 foot by 1 foot.
Scale—1 inch = 25 feet.
Radius of Saucer = 3 feet.

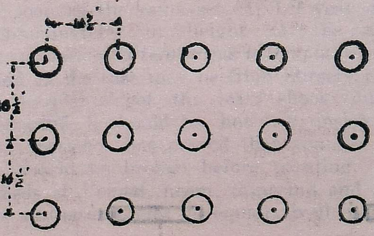

FIG. 1

CROSS-SECTION.

Scale—1 inch = 1 foot.

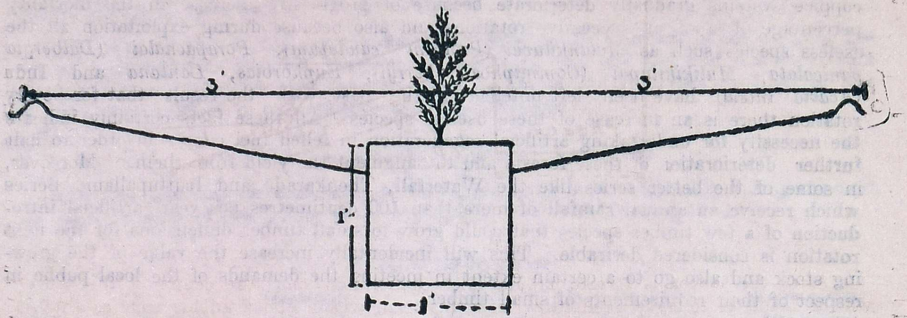

FIG. 2

PLAN OF PLANTING

Size of trench = 6 feet by 1 foot by 1 foot.

Scale = 1 inch = 10 feet.

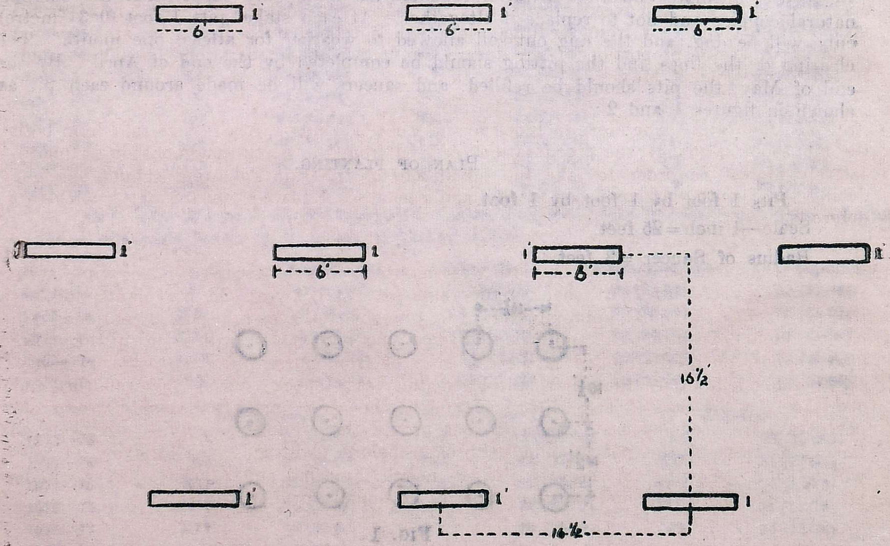

FIG. 3.

CROSS SECTION.

Scale 1 inch = 1 foot.

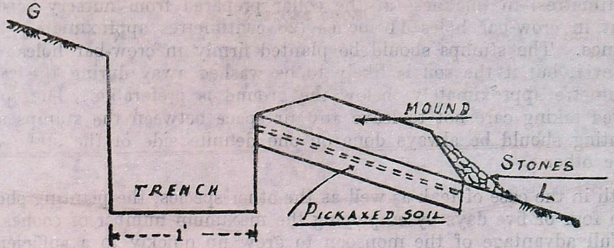

FIG. 4.

After the saucer is formed around the regeneration spot, the centre of the saucer will be made as to have a slightly raised platform within the availbale soil, so that it may receive the seed or seedling as shown in the diagram. The slanting surface of the saucers should be dressed clean so that all the water received by drains down to the lowest spot around the 1 foot (·31 metre) cube of soil. The slanting surface will be dressed with a bund along the periphery, but formed only on the sloping side in a half moon shaped manner so that any water collected above may also drain into the saucer.

(b) *Trench and mound technique.*—This method will be adopted only on sloping country and will be as follows :—

Soon after the contractor vacates the strip, trenches 6 feet by 1 foot by 1 foot (1·83 metres by ·31 metre by ·31 metre) will be dug along the contour at a distance of 16½ feet (5·03 metres) from centre to centre. The trenches in the succeeding lines will be arranged in an alternate fashion in order to collect all the water that drains down the hill slope as described in figure 3. The dug out earth will be put on the low hill side to form a mound to receive the seed or seedlings and stabilised by a few pebbles or boulders to prevent soil wash as shown in figure 4. In attending to these preliminary operations, all rank and weed growth will be cleared, but natural regeneration of useful species from coppice or from seedling origin will not be disturbed as they are expected to form an useful proportion of the future crop. All these operations should be completed by the end of May.

521. *Planting.*—The areas included in the Fuel Working Circle receive rain from both the monsoons, although the precipitation received from the north-east monsoon is quantitatively more. In order to take full advantage of the rain, planting should be done during the south-west monsoon itself and casualties replaced during the north-east monsoon.

522. The first showers of the south-west monsoon may be received at any time after the first week of June. As soon as the rains set in, 1-2 year old pot plants not less than 18 inches (45 cms. approximately) in height of the species mentioned in paragraph 499 excepting teak and *vengai* (*Pterocarpus marsupium*) will be put in the centre of the saucer pit or the mound as the case may be from nursery raised stock kept ready, care being taken to see that the plants get the least shock during the transport and planting. In the case of Tamarind, it should be, however, insisted that only 2 year old pot plants are used, as past experience has proved that younger seedlings are likely to fail. The base of the pots should be broken before planting. No retrieving of pots will be done. Sowings of seeds of *Vengai*, neem, tamarind and *Albizzia* species will be also made along the mounds as these species do equally well in the sowings.

523. In the case of teak and *vengai* (*Pterocarpus marsupium*) one year old or even older stumps of about 10 inches (25 centimetres approximately) long and 0·4 to ·8 inches (1 to 2 centimetres) in thickness at the collar prepared from nursery raised seedlings should be put in crow-bar holes 11 inches (28 centimetres approximately) deep dug a little in advance. The stumps should be planted firmly in crow-bar holes flush with the ground level, but if the soil is likely to be washed away during the rains, half an inch (1 centimetre approximately) below the ground is preferable. The soil should be well compacted taking care not to leave any air space between the stumps and the soil. Original planting should be always done on one definite side of the stake and replacements on the other.

524. Both in the case of teak as well as the other species, the planting should be completed within four or five days by employing the maximum number of coolies, so that the plants take full advantage of the monsoon to grow up quickly to a sufficient height to withstand the rigours of the coming summer.

SECTION 8—NURSERY.

525. *Seed collection and storage.*—The following table indicates the time for seed collection for the species recommended for planting :—

Serial number and name of species.	Time of collection of seed.
1 *Azadirachta indica*	June—August
2 *Albizzia lebbek*	February—March
3 *Albizzia odoratissima*	November—December
4 *Albizzia procera*	February—May
5 *Acacia ferruginea*	March—April
6 *Pterocarpus marsupium*	January—March
7 *Tectona grandis*	January—February
8 *Tamarindus indica*	February—April

526. The seeds should be collected locally from sound and well-grown trees. In the case of teak, the seeds should be preferably collected from trees of plantation origin. The 1926 experimental plantation consisting of a well-grown group of trees with sound straight boles is ideal for this purpose.

527. Seeds of Neem are not viable if stored for a long time owing to the oily nature of the seeds. Seeds of the remaining species retain their viability for a year if stored properly. They should be separated from the pericarp, dried and stored in gunny bags and used the same year.

528. Since the nursery technique for preparation of pot plants and teak stumps is different, they are described separately—

(*a*) *Preparation of pot plants.*—Past experience in the division as also elsewhere in the State has shown that one of the chief causes of failure of dry fuel regeneration areas is due to planting of small seedlings in the field. As the conditions in summer in these areas are fairly severe, small seedlings do not develop a sufficiently long root system by the onset of summer to tide over the drought period. In order to get over this difficulty, it is essential that older plants not less than 18 inches (45·72 centimetres) in height are put. To prevent these plants from putting over a long root system before actual transplanting in the field, they should be raised in closed containers. Past experience with reed or palmyra containers has shown that they are short-lived and the root system gets invariably disturbed during the course of transplanting. To get over this difficulty, closed earthern plots $\frac{3}{4}$ to 1 foot (21 to 31 metre) high with a diameter of 4 inches (10 centimetres approximately) at the top will be used. One or two small holes will be made at the bottom of the pot to allow drainage of excessive moisture. These pots will be filled with good loamy soil, and rammed so that the soil layer is an inch (2·5 centimetres) below the foot of the pot to facilitate watering. The pots should be got ready by June, two years before the planting year.

Two seeds of *Pterocarpus marsupium*, *Albizzgia lebbek*, *Albizzia odoratissima*, *Azadirachta indica*, *Tamarindus indica* and *Acacia ferruginea* should be sown per pot as and when the seeds become available during the months of June to December eighteen months to 2 years prior to the date of planting. The seeds quickly germinate. Resowing will be done a fortnight later in such of those pots where germination is absent. The pot plants should be watered during non-rainy days and kept free from weeds. The watering should be done sparingly in order to acclimatise the plants to the dry conditions in the field. The pot should be kept under shade near a water source so as to facilitate watering. Care should be taken to provide the sufficient number of pot plants that may be required for the annual regeneration areas and for replacement of casualties.

(b) *Teak nursery technique.*—The nursery technique for preparation of teak and *Vengai* stumps will be the same as described in paragraphs 359 to 373 of the Teak Conversion Working Circle.

Section 9—Subsidiary Silvicultural Operations.

529. *Tending—First year.*—Three weedings will be done during the first year. The weeding will consist of scraping off all miscellaneous growth competing with the plants put in the regeneration area, and cutting of all climbers and uprootal of all *Lantana* occurring inside the coupe. The first weeding will be done in July.

530. The second weeding will be done in October a little prior to the setting of the north-east monsoon, combined with a soil working to a depth of 3 to 6 inches (7 to 15 centimetres approximately) and a width of 9 inches (22 centimetres approximately) at a radius of a foot (·31 metre) away from the plant in the saucer or the mound as the case may be. The saucers and the trenches will be mended at the same time. The casualties will be replaced during the north-east monsoon.

531. A third weeding combined with soil working will be done late in December when the north-east monsoon has abated. The saucers and trenches will be mended at the same time.

532. In the later half of February, a hot weather mulching around the plants will be done.

533. *Second year.*—In the second year there will be 3 weedings. The first weeding will be in June combined with soil working. The saucers and trenches will be mended at the same time.

534. The casualties of the first year will be replaced during the south-west monsoon.

535. The second weeding will be done in August combined with soil working and weeding of the saucers and trenches.

536. A third weeding and soil working will be done in December and this will be for the backward plants only.

537. *Third year.*—Ordinarily, no tending operations are prescribed for the third year. If in any case the plantation remains not properly stocked due to unforeseen reasons, the District Forest Officer will prescribe such operations as he deems it necessary after obtaining the prior orders of the Conservator of Forests.

538. *Clearing of growth within each strip.*—During all the weedings prescribed during the first two years, the strip lines will be cleared of all miscellaneous growth excepting regeneration from coppice or seed of useful species, so as to keep the plants free from competition.

Section 10—Other Regulations.

539. *Demarcation.*—The coupes will be demarcated with stones at the four salient corners, engraved as usual with the number of the coupe, the year of felling, as well as the adjacent coupe number and its year of working. The number of a coupe is governed by the actual sequence of fellings, so that if the sequence allotted in this plan is revised for any reason, the numbers should also be revised so as to conform with the revised sequence.

540. *Plantation boards.*—The area regenerated in each year's coupe will be indicated by a small wooden board of uniform size fixed at salient points. The board should indicate in English and in Tamil the year of formation and the actual area planted.

541. *Fencing.*—A thorn fence will be raised along the periphery of the regeneration area during the year of planting. The fence will be maintained during the second and third year also.

542. *Grazing.*—Felled coupes will be normally closed to grazing for a period of six years, including the year of exploitation, in view of the artificial regeneration prescribed. If in the opinion of the District Forest Officer, certain specified coupes require to be closed to grazing for a longer period for silvicultural reasons, the period of such closure shall be fixed by the Conservator.

543. All closed areas should be distinguished by prominent notice boards painted red and engraved in white letters in Tamil and in English notifying the fact of closure to the public. The closure will be also notified in the District Gazette in the manner prescribed in the chapter on Grazing Working Circle.

544. *Fire-protection.*—Situated as the fuel series are mostly along the lower slopes of the deciduous forests, they are subjected to periodic fires during the dry season. Any fire that may occur must be immediately extinguished by the local subordinates. The rigid closure of areas burnt after a big fire has occurred is essential for the recovery of the area and must be enforced. To be of effect, such closure must follow immediately after the fire. The procedure to be adopted is detailed under the prescriptions of the Grazing Working Circle.

545. For the portions under regeneration in the annual coupe, it is considered that the annual clearing of the periphery of the regeneration area is quite adequate to prevent the entry of any chance fires.

546. *Staff.*—Since there would be not more than 1 fuel series in a beat, and the regeneration area in each year's annual coupe by itself no means large, it is considered that employment of special staff or plot mazdoors would be quite superfluous. The regeneration works can very well be attended to by the local staff.

SECTION 11—CONTROL.

547. *Record of statistics.*—The contractor will furnish to the Range Officer not later than the 10th of every month, a statement showing the removals of the previous month of fuel in stacks, or cartloads and under cover of head-load permits, manure leaves, and species and volume of timber extracted.

548. The Range Officer will send a monthy abstract of these accounts for each coupe in the range to the District Forest Officer so as to reach him by the 20th of the same month. The total removals of fuel and timber during the year will be abstracted in the District Forest Office and entered in the appropriate column of the control book. The following conversion factors will be adopted :—

75 cubic feet of stacked fuel—1 ton of fuel (1.016 metric tonne).

50 cubic feet of round timber—1 ton of timber (1.016 metric tonne).

40 head loads of fuel—1 ton of fuel (1.06 metric tonne).

549. The following control records will be maintained by the District Forest Officer :—

(1) Control book.

(2) Record of works.

(3) Control journal for the working circle.

(4) Control maps.

(5) Plantation and nursery journals.

550. They should be posted at the close of each financial year in the manner as described in Sections K and L of the Chapter on Miscellaneous Regulations.

CHAPTER V—WORKING PLAN FOR THE BAMBOO WORKIMG CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

551. *General Constitution.*—The Bamboo Working Circle comprises all areas in the Walayar and Bolampatti Valleys in which bamboo is found in workable quantities.

552. Bamboos occur over a large part of the area covered by the working plan. The sholas, above an elevation of about 3,500 feet (1,067 metres), do not contain any bamboo, although reeds may be occasionally present. The outer eastern ends in both the Bolampatti and Walayar Valleys where poor scrub prevails, bamboos are also absent.

553. In general, this working circle will include all the areas included by Van Haeften in his Bamboo Working circle. In addition, certain new areas containing bamboos in workable quantities, but not included in the past plan have been included in this working circle.

554. *Area.*—The total gross area of the working circle is 36,548 acres (14,754.19 hectares), which includes areas devoid of bamboo also but which have been included in order to obtain convenient natural boundaries for purposes of management. The net bamboo bearing area has been estimated to be 28,900 acres (11,731.96 hectares).

555. *Character of the vegetation.*—Both the bamboos, *Bambusa arundinacea* and *Dendrocalamus strictus* are met within the working circle. The comparatively moister tracts towards the west are occupied by *Bambusa*, which sometimes grows to a considerable size, as round Parapatti and in the Kalkothi Valley. In drier aspects and as one proceeds eastwards, *Dendrocalamus* predominates, *Bambusa* confining itself to stream banks. While *Dendrocalamus* mostly disappeared in the softwood and teak conversion coupes owing to burning and repeated weedings, it has in many places invaded fuel coupes particularly in the Poondi and Kallar fuel series to the detriment of coppice regeneration.

556. Gregarious flowering of *Dendrocalamus strictus* commenced in the Sholakarai Block in 1957 and practically all the bamboos are dead now. The flowering has now touched the Thenkaradu and Konamalai blocks and appears to move gradually northwards and north-west wards. Natural regeneration in the flowered areas was noticed by the writer at the time of writing this plan.

SECTION 2—DIVISION OF THE AREA.

557. The following statement gives particulars of the bamboo series constituted under this working circle :—

Number.	Name of the felling series.	Area in acres (hectares). Total.	Area in acres (hectares). Effective.	Boundaries.
1.	Navakkarai ..	8,091 (3,274·34)	7,540 (3.051·36)	*North* :—The common water shed line between the northern and southern slopes of the Bolampatti Block I and II Reserves from △ 3988 until the point where the Walayar (Sholayar) River takes its origin. *East* :—The Chunnambu Odai. *South* :—The southern boundary of Bolampatti Block I and Small Sholakarai Reserves. *West* :—The Walayar River forming the Inter-State boundary between Madras and Kerala.

Number.	Name of the felling series.	Area in acres (hectares). Total.	Effective.	Boundaries.
2.	Irattupallam ..	11,260 (4,556·81)	8,500 (3,439·86)	*North* :—Northern boundary of Bolampatti Block I and II Reserve Forests from △ 1756 to the point where the Periyar River emerges out from the reserve boundary. *East*:—A line running along the crest of a ridge east of Karamadai connecting △ 1756 with △ 2986. *South* :—The common water-shed line between the northern and southern slopes of the Bolampatti Blocks I and II Reserve Forests from △ 2986 to the point where the Walayar (Sholayar) River takes its origin and thence extending along the inter-State boundary between Madras and Kerala to the point where the Periyar River takes its origin. *West and North-west* :—The Periyar River.
3.	Savakad	17,107 (6,923·03)	12.950 (1,240·75)	*North* :—The inter-State boundary between Madras and Kerala. *East* :—The common boundary between Bolampatty Block II and Block III Reserve Forests and thence extending along the eastern boundary of Bolampatti Block II Reserved Forest from △ 1764 upto the point where the Periyar River emerges out from the Reserve Forest. *South* :—The Periyar river. *West* :—The inter-State boundary between Madras and Kerala.

558. In demarcating these series natural boundaries have been adopted to the extent possible.

559. In the past working plan, as many as six bamboo felling series were constituted in the range. The constitution of too many series often led to ring formation among prospective bidders thereby resulting in low prices being offered for some of the coupes during certain years and the sales could not be confirmed. Moreover, the coupes in the Parapatti and Sholakarai series were rather too small that they could not be sold during some years for want of demand. It is also not necessary to have a separate series at Parapatti with the idea of providing labour for the Parapatti Irulars, as the latter have long since abandoned this settlement and migrated to the adjacent forests in Kerala State. Hence the existing six series are amalgamated to form three compact and contiguous series for the period of this plan.

Section 3—Analysis and Valuation of the crop.

560. The areas proposed to be included in the Bamboo Working circle have been occularly stock-mapped under three categories :—

(*a*) Areas well-stocked with bamboos;

(*b*) Areas partially stocked with bamboos; and

(*c*) Areas with a few scattered bamboos, or with no bamboos.

561. The stock-maps thus prepared have been filed with the working plan records.

562. Only areas falling under categories 1 and 2 have been included within this working circle. Areas in the Sholakarai and Thenkaradu Blocks which were once predominantly covered with bamboos, but are now devoid of bamboo growth owing to the recent gregarious flowering have also been included in the working circle. Young regeneration is noticed all over and the areas are likely to be filled with bamboos in a few years.

563. No detailed analysis of the crop was made as it was not called for.

SECTION 4—METHOD OF TREATMENT.

564. *System of management.*—The system of management adopted in this working circle may be defined as 'Selection thinning of bamboo clumps'.

565. *Felling cycle.*—A felling cycle of three years is prescribed as in the past plan. This is the period generally adopted for the working of bamboos in the State.

566. *Regulation of the yield.*—The yield will be regulated by area. In each felling series therefore, the size of the annual coupe is obtained by dividing the total area by the felling cycle. The coupes constituted in each felling series have been based to some extent on the effective area under bamboos in each coupe but to a greater extent depending on the topographical features of the country over which the bamboos lie scattered. In the layout of the annual coupe, natural features have been adopted.

SECTION 5—METHOD OF EXECUTING FELLINGS.

567. *Agency of exploitation.*—The fellings will be made through the agency of contractors, by selling the coupes prescribed for the year in open auction.

568. *Period of contract.*—The lease period will be one year for each coupe and will be concurrent with the fiscal year. Each annual coupe will form a separate lease unit.

569. *Felling rules.*—The following felling rules are prescribed :—

(i) A minimum of 6 mature culms should be left in each clump; a culm will be considered mature, if it is at least one year old.

(ii) No culm which is less than a year old shall be felled.

(iii) No culm should be removed with the rhizone.

(iv) Culms shall be cut clean and as low as possible but not below the first node from ground level.

(v) Fellings shall be made as far as possible on the side of the clump opposite to that from which the largest number of new culms spring up.

(vi) Top or bottom pieces of culms unwanted by contractors will not be left hanging within the clump as they will cause clump congestion and possible crown fires. These should be extracted and left lying on the forest floor, if not required by the contractor.

(vii) Bamboo clumps in the teak conversion coupe of the year will be the property of the plantation coupe contractor of the year and not of the bamboo contractor.

(viii) Bamboo clumps in teak conversion coupes and teak plantations may be felled without conforming to any of the rules laid down above as it is intended to discourage bamboo growth in them.

(ix) Bamboos in a fuel coupe under working will be the property of the fuel coupe contractor and not of the bamboo coupe contractor. The fellings will however strictly conform to the Bamboo Felling Rules.

570. It is generally observed that the felling rules for working bamboo coupes are more often ignored than not. Immature culms are removed without leaving a minimum, resulting in rapid deterioration of clumps. It is also seen that culms are invariably cut high, even at a height of 15 to 20 feet (4.5 to 6 metres), or the bottom piece is removed and the top piece left hanging, so that the evil of incomplete removal continues until the clump becomes hopelessly congested. No doubt the contractors are usually fined for violating the felling rules, but it is very necessary that bamboo working receives closer attention than it has in the past from the Range Office, Foresters and Forest Guards,

whose aim should be to concentrate on instructing contractor's labour in the field and check their work constantly, instead of being satisfied with merely detecting and reporting irregular fellings to their superiors and wash off their hands.

571. *Supply of local demand.*—The bamboo coupe contractor shall at all times during the period of his contract sell to ryots on demand for their bona fide and domestic agricultural purposes bamboos at such rates as may be fixed by the District Forest Officer in consultation with the Collector.

572. The contractor shall also be bound to supply to the Basket-makers' Co-operative Societies, their requirements of bamboos (not splits) at such rates as may be fixed by the Government from time to time.

SECTION 6—TABULAR STATEMENT OF FELLINGS.

573. Mention has been made elsewhere of the gregarious flowering of bamboos in the Sholakarai, Thenkaradu and Konamalai Blocks which consitute the Navakkarai Bamboo Felling Series. Consequently, there can be otherwise no exploitation of bamboos in this series until the natural regeneration now observed all over the forests reach an exploitation size. Bamboos generally take 7 to 8 years to reach exploitable proportions. As the existing natural regeneration is now 2 to 3 years old, it will be prescribed that the first bamboo coupe in this series will be put up for sale during 1965–66. In the other series, coupes will be sold regularly during all the years of the period of this plan.

574. The details regarding the three coupes that have been constituted in each series and their years of exploitation during the period of this plan are shown in the following statement. Coupes which are to be worked during the succeeding five years are also indicated so that there may be no break in the continuity of controlled working in case the revision of this plan is not taken in time.

Navakkarai Bamboo Felling Series.

Year of working.	*Name and number of coupe.*	*Area of the coupe in acres (Hectares).* *Gross.*	*Effective.*	*Boundaries.*
(1)	(2)	(3)	(4)	(5)
1967–68 1970–71 1973–74 1976–77	Navakkarai .. Bamboo Coupe I	3,465 (1,402·25)	3,200 (1,294·22)	*North* : The common watershed line between the northern and southern slopes of Bolampatti Blocks I and II Reserved Forests from the point of origin of the Koochimalai ar (a name given by the writer) to the point of origin of the Walayar (Sholayar) River. *East* : The Koochimalai ar. *South* : The southern boundary of Bolampatti Block I reserved Forest from the point where the Koochimalai ar leaves the reserve boundary up to the point where it meets the Walayar river. *West* : The Walayar river.
1965—66 1968—69 1971—72 1974—75	Navakkarai Bamboo Coupe II	2,980 (1,205,97)	2,700 (1,092.66)	*North* : The common watershed line between the northern and southern slopes of Bolampatti Block I Reserved Forest from △2988 up to the point of origin of the Koochimalai ar. *East* : The Chunnambu odai. *South* : The southern boundary of Bolampatti Block I Reserved Forest from the point where the Chunnambu Odai leaves the reserve boundary upto the point where it meets the Modamathi odai; thence extending along the Mattupatti line until cairn No. 55; and thence along the reserve boundary until it meets the Koochimalai ar. *West* : The Koochimalai ar.

Year of working.	*Name and number of coups.*	*Area of the coups in acres (Hectares.* *Gross.*	*Effective.*	*Boundaries.*
(1)	(2)	(3)	(4)	(5)
1966—67 1969—70 1972—73 1975—76	Navakkarai Bamboo Coupe III	1,646 (666·12)	1,640 (663·68)	*North* : The Mattupatti line. *East* : The eastern boundary of Bolampatti Block I Reserved Forest from cairn No. 115 to cairn No. 55. *South* : The Southern boundary of the Small Sholakarai reserved forest. *West*: The western boundary of Bolampatti Block I Reserved Forest from Sengalpallam upto cairn No. 88.

Iruttupallam Bamboo Felling Series.

1964—65 1967—68 1970—71 1973—74 1976—77	Iruttupallam Bamboo Coupe I	2,735 (1,106·80)	2,300 (930·79)	*North* : Northern boundary of Bolampatti Block I reserved Forest from △1756 to △1688. *East* : A line running along the crest of a ridge east of Karamalai connecting △1756 with △2988. *South* : The common Watershed line between the northern and southern slopes of Bolampatti Block I Reserved Forest from △2988 to △3637. *West* : The crest of the Valakaradu from △3637 to △1688.
1962—63 1965—66 1968—69 1971—72 1974—75	Iruttupallam Bamboo Coupe II	3,559 (1,540)	2,700·29 (1092·66)	*North.* The northern boundary of Bolampatti Blocks I and II Reserve Forests from △1688 to the point where the Nandangiripallam emerges out from the reserve forest. *East*: The crest of the Valakaradu from △1681 to △3637. *South*: The common watershed line between the northern and Southern slopes of Bolampatti Block I and II Reserve Forests from △3637 to the point where the point Walayar (Sholayar) takes its origin; thence extending along the inter-State boundary between Madras and Kerala to the point where the Nandanagiripallam takes its origin. *West* : The Nandanagiri pallam.
1963—64 1966—67 1969—70 1972—73 1975—76	Iruttupallam Bamboo Coupe III	4,966 (2,009·66)	3,500 (1,416·41)	*North and north-west* : The Periyar River. *East*: The eastern boundary of Bolampatti Block II Reserve Forest between the points where the Periyar River and the Nandanagiripallam emerge out from the reserve forest; thence extending along the course of the Nandanagiri pallam up to the point of its origin. *South and south-west* : The inter-State boundary between Madras and Kerala.

Savakad Bamboo Felling Series.

1964—65 1967—68 1970—71 1973—74 1976—77	Savakad Bamboo Coupe I	7,555 (3,146·45)	4,500 (1821·1)	*North* : Cart-track leading from Thanneerpandal to Poondi temple, and thence extending along the footpath to the Vellingiri Peak. *East*: The eastern boundary of Bolampatti Block II Reserve Forest from Thanneerpandal to the point where the Periyar River emerges out of the reserve forest.

Year of working. (1)	Namv and number of coups. (2)	Area of the coupe in acres (Hectares). Gross. (3)	Effective. (4)	Boundaries. (5)
				South: The Periyar river. *West*: The inter-State boundary between Madras and Kerala.
1962—63 1965—66 1968—69 1971—72 1974—75	Savakad Bamboo coupe II	5,445 (2,203·51)	4,450 (1,800·87)	*North*: The Walmukkiar river. *East* The eastern boundary of Bolampatti Block II Reserve Forest from the point where the Walmukkiar River emerges out of the Reserve Forest upto Thanneerbandal. *South*: The cart-track from Thanneerbandal to Poondi and the foot-path from Poondi to Vellingiri Peak. *West*; The inter-State boundary between Madras and Kerala.
1963—64 1966—67 1969—70 1972—73 1975—76	Savakad Bamboo Coupe III	4,107 (1,662·06)	4,000 (1618·78)	*North* : The inter-State boundary between Madras and Kerala. *East*: The Common boundary between Bolampatti Block II and Block III Reserve Forests. *South*: The outer boundary of Bolampatti Block II Reserve Forest from △ 1764 upto the point where the Walmukkiar River emerges out from the Reserve Forest. *South-west* and *West*: The Walmukkiar River.

575. In case gregarious flowering occurs in the Iruttupallam and Savakad Series or in portions of these series, the District Forest Officer will sell such flowered areas for removal of all the dead culms regardless of the tabular statement of fellings and the bamboo felling rules in order to prevent a conflagration of fire. With the removal of all dead bamboos, the flowered coupes will be excluded from working until such time the resultant regeneration grows to exploitable proportions.

SECTION 7—OTHER REGULATIONS.

576. *Grazing*.—The forests included in this working circle will be open to grazing at all times.

577. *Fire protection*.—The working circle will be protected from fire under the prescriptions for general fire protection contained in Section E of Chapter VIII.

SECTION 8—CONTROL.

578. *Record of Statistics*.—A monthly account of all removals of bamboos shall be rendered to the Range Officer by the lessees, not later than the 10th of the subsequent month. Details must be furnished showing the out-turn and removes under the different local classes of bamboos, the rates charged by the contractor for each class and current sale rates.

579. The Range Officer will send a monthy abstract of these accounts for each coupe in the range to the District Forest Officer so as to reach by the 20th of the same month for incorporation in the control records and the timber registers.

580. Bamboos extracted departmentally will be taken to stock and accounted for as required by the Forest Code.

581. *Control*.—A Control book, Control journal and Record of works will be maintained by the District Forest Officer for this working circle. The manner in which these forms are to be maintained are indicated in Chapter VIII.

582. *Flowering of bamboos*.—Special mention should be made in the control journal when any sporadic or general flowering of bamboos is noticed in any particular locality or localities in the range.

CHAPTER VI.—WORKING PLAN FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE.

583. The Minor Forest Produce Working Circle will cover all the forests under the control of the Forest Department in the Bolampatti Range and, for the purpose of the sale of *Avaram* (*Cassia auriculata*) bark only, the unreserves and road margins also. The prescriptions framed herein will apply to the farming of all the minor forest produce occurring within the working circle, with the exception of bamboos which have been dealt with separately.

SECTION 2.—ANALYSIS AND VALUATION OF THE CROP.

584. There are a great variety of minor forest produce in the Bolampatti Range, but they are not collected on a large scale, due to limited demand in the market and lack of proper organisation on the part of the minor forest produce contractors in the collection of any produce other than those with which they are very familiar. There is reason to believe that the yield from minor forest produce is capable of considerable expansion. The chief items of minor forest produce which occur in the area are :—

	English or Tamil name. (1)	*Botanical name of species.* (2)	*Portion used.* (3)
1	Arrow-root	*Curcuma angustifolia*	Stem tuber.
2	Athikai	*Ficus* species	Fruits.
3	Avaram bark	*Cassia auriculata*	Bark.
4	Bees Wax	..	
5	Black dammer	*Canarium strictum*	Gum.
6	Cardamom	*Elettaria cardamomum*	Fruits.
7	Cashew-nuts	*Anacardium occidentale*	Fruits and nut.
8	Clearing nut	*Strychnos potatorum*	Seeds.
9	Curry leaves	*Murraya koenigii*	Leaves.
10	Cut stone	..	
11	Deer horns	..	
12	Eacham grass	*Phoenix acaulis*	Leaves.
13	Elandai	*Zizyphus mauratiana*	Fruits.
14	Fodder grass	Several species	Entire plant.
15	Gall nut	*Terminalia chebula*	Fruits.
16	Garudakodi	*Aristolochia roxburghiana*	Fruits.
17	Ginger	*Zingiber officinale*	Stem tuber.
18	Gravel	..	
19	Gum kino	*Pterocarpus marsupium*	Gum.
20	Honey	..	
21	Indukodi	*Acacia intsia*	Bark.
22	Indunar	*Acacia intsia*	Fibre.
23	Kanakamugu	*Pinanga dicksonii*	Fruit and leaves.
24	Kathalai	*Agave* species	Fibre.
25	Kattujathikai	*Knema attenuata*	Fruit.
26	Kattumandarai	*Bauhinia vahlii*	Leaves.
27	Kilakkai	*Carissa carandas*	Fruit.
28	Kodivaliver	*Tinospora cordifolia*	Roots.
29	Konnai bark	*Cassia fistula*	Bark.
30	Koovai	*Curcuma angustifolia*	Leaves.
31	Korai grass	*Cyperus rotundus*	Stem.
32	Kundumani	*Abrus precatorius*	Seeds.
33	Mahali Kilangu	*Gymnena montanum*	Roots.
34	Mohwa	*Madhuca latifolia*	Flowers and seeds.
35	Nannariver	*Hemidesmus indicus*	Roots.
36	Neem seeds	*Azadirachta indica*	Seeds.
37	Nuxvomica	*Strychnos nuxvomica*	Leaves, fruits, seeds and bark.
38	Odankodi	*Hippocratea indica*	Stem.
39	Plantain leaves	*Musa* species	Leaves.
40	Peypodal	*Trichosanthes cucumerina*	Fruits.
41	Pungam seeds	*Pongamia pinnata*	Seeds.
42	Rattan	*Calamus* species	..
43	Reeds	*Ochlandra beddomei*	Stem.
44	Sambhur horns	..	
45	Screwpine flowers	*Pandanus* species	Flowers.

English or Tamil name.	Botanical name of species.	Portion used.
(1)	(2)	(3)
46 Soap-nut	*Sapindus emarginatus*	Fruit.
47 Shekoy	*Acacia concinna*	Fruit.
48 Stonemoss	..	
49 Sundakai	*Solanum trilobatum*	Fruit.
50 Tamarind	*Tamarindus indica.*	Do.
51 Tellukai	*Entada phaseoloides*	Do.
52 Thanikai	*Terminalia belerica*	Do.
53 Thippili	..	Do.
54 Turmeric	*Curcuma longa*	Stem tuber.
55 Vembadam	*Ventilago madraspatana*	Bark.
56 Wild Brinjal	*Solanum* species	
57 Wild jack	*Artocarpus heterophyllus*	Fruit.
58 Wild mangoes	*Mangifera indica*	Do.
59 Wood-apple	*Feronia elephantum*	Do,

585. The average annual revenue for the decennium 1950—51 to 1959–60 from the sale of minor forest produce is Rs. 12,078.42. The revenue is bound to increase in the coming years due to the phenomenal rise in the prices for tamarind.

Section 3—Division of the area.

586. In order to stimulate competition, wherever feasible, the range is divided into 'farms' based partly on the kind of minor produce concerned and partly on the configuration of the country. Wherever a particular produce exists in sufficient quantities, e.g., tamarind or *avaram* bark, they are put up for sale separately. The units of sale are noted in the statement below :—

Units of sale and nature of produce.	Number of farm and locality.	Remarks.
(1)	(2)	(3)
1 All minor forest produce except Tamarind, *Avaram* bark, Stone and gravel.	Farm I consisting of Navakkarai section.	
2 Do.	Farm II consisting of Karadimadai and Vellapathy sections excluding Irular and Muduvar settlements.	
3 Do.	Farm III-Narasapuram section excluding Irular settlements.	
4 Usufructs of Tamarind	Farm I-Navakkarai section	
5 Do.	Farm II-Karadimadai and Vellapathy sections excluding Irular and Muduvar settlements.	
6 Do.	Farm III-Narasapuram section excluding Irular Settlements.	
7 *Avaram* bark	The reserves and unreserves of Bolampatti Range.	The sale amount in respect of *avaram* bark will be divided between the Revenue and Forest Departments on a 50 per cent basis as per terms agreed to between the Collector and the District Forest Officer with reference to G.O. (No. 520) Mis. Development, dated 12th March 1942.

Section 4—Method of Treatment.

587. *Agency of exploitation.*—All minor forest produce other than stone and gravel, deer and sambhur horns, and valuable remains of dead animals, will be exploited through the agency of contractors. The right to collect the produce will be leased out annually by sale in open auction.

588. Deer and sambhur horns and the valuable remains of dead animals will be collected departmentally in the interests of preservation of wildlife, because contractors may not necessarily confine their collection to these horns found fallen on the forest floor.

589. Stone and gravel will continue to be leased out at seigniorage rates to the desirous public from the existing quarries at Madukarai, Attukal, Dhaliyur and Marudamalai as there appears to be little demand for the quarry sites when sold in auction. The following are the seigniorage rates levied :—

	RS.	P.	
Rough stone	1	37	per 100 cft. (2·8 cubic metre).
Chiselled stone	3	75	Do.
Metal and gravel	0	75	Do.
Earth and turf	0	47	Do.

590. It is however prescribed that the area of the quarry site should be demarcated on the ground and specified on the seigniorage permit by the District Forest Officer in order to prevent quarrying all over the place.

591. *Period of lease.*—All minor forest produce sale units except tamarind and *avaram* bark will be leased out for the fasli year from 1st July to the 30th June.

592. In the case of tamarind, the lease period will be for 6 months from the 1st of January to the 30th of June.

593. In the case of *avaram* bark, the lease period will be the financial year from the 1st of April to the 31st of March.

594. *Auction sales.*—Auction sales will be held between the 15th of May and the 15th of June for all items of minor forest produce except tamarind and *avaram* bark. In the case of tamarind, the sales will be held between the 1st of November to the 15th of November. In the case of *avaram* bark, the auction will be held between the 15th of February and the 15th of March. In case the prices obtained at the sales are not satisfactory, it is suggested that tenders may be called for by the District Forest Officer.

SECTION 5—SUBSIDIARY SILVICULTURAL OPERATIONS.

595. Owing to large scale felling of tamarind trees in private lands during the past few years and the resulting short supply in respect of tamarind fruits, there has been a phenomenal increase in the prices for this commodity which pays a key role in the Indian culinary art. It is therefore necessary to increase the planting of this species to the maximum extent possible in all suitable localities.

596. Provision has already been made to introduce tamarind as one of the species while artificially regenerating felled fuel coupes. This is perhaps the only way of increasing the proportion of this valuable species in an area otherwise worked for fuel also.

597. It is also prescribed that annually an area of 20 acres in the range is taken up in suitable localities for raising tamarind farms. It is better that these farms as far as possible are located contiguously.

598. Pot plants of tamarind about 2 years old should be planted in 1 foot (.31 metre) cube pits dug and kept about 16½ feet (5.02 metres) part. Advantage will be taken of *kumridars* wherever available. Localities obviously unsuitable for tamarind such as rocky ground will not be planted. Three feet (one metre) wide saucer shaped depressions will be made with a view to conserve water all round the plants. The details of planting technique will be the same as prescribed in the Fuel Working Circle.

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SECTION 6—CONTROL.

599. The following control forms should be maintained and posted by the District Forest Officer before the end of each financial year :—

(a) Control book,

(b) Record of works, and

(c) Control journal.

600. The manner in which these forms are to be written is detained in Section K under the chapter on Miscellaneous Regulations.

CHAPTER VII—WORKING PLAN FOR THE GRAZING WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE.

601. This working circle will include all the forests in this range under the control of the Forest Department, except such areas as will be closed to grazing for silvicultural or other reasons.

602. The areas closed to grazing will fall under the following categories, namely :—

(i) Areas closed for specified periods under the provisions of the plan;

(ii) Areas temporarily closed to grazing under the provisions contained in the Madras Forest Manual as a punitive measure in cases of unauthorised and wanton burning by the people of the locality.

603. *Closure for silvicultural reasons.*—Temporary closure to grazing will be applied for silvicultural reasons as follows :—

(i) All coupes of the Selection, Teak, Conversion and Fuel Working Circles will be closed for a period of 5 years including the year of coupe working in view of the regeneration operations undertaken.

(ii) All softwood plantations raised prior to the commencement of the prescriptions of the plan will be closed for a period of 5 years including the year of formation.

(iii) All sandalwood propagation centres and areas raised under the prescriptions of Chapter VIII will be closed to grazing for a period of five years including the year of formation.

604. It is seen that several fuel regeneration areas or Conservator's plots although complete failures have been closed to grazing for several years now. These will be henceforth thrown open to grazing as the closure does not serve any purpose.

605. All areas where experiments or research are conducted will be completely closed to grazing for certain specified periods as may be fixed by the State Silviculturist or the District Forest Officer from time to time.

606. In addition, areas subject to incendiarism may also be closed for grazing subject to the condition that the aggregate of the area so closed at a time does not exceed 500 acres (202.34 hectares) in one particular locality and provided that the District Forest Officer submits a report to that effect to the Collector and to the Chief Conservator of Forests through the Conservator of Forests. This course will be adopted as a punitive measure only when the District Forest Officer considers that the damage to the growth is severe as to warrant closure to grazing for silvicultural reasons. Such closure should in any case follow swiftly after the fire, so that it may have the maximum effect.

SECTION 2—METHOD OF TREATMENT.

607. *Regulation of grazing fees.*—Grazing will be regulated by the issue of permits printed in accordance with the provisions contained in the Madras Forest Manual. The following domestic animals may be licensed to graze, the existing fees being levied for all the areas in the range.

Description of animals.	*Rate per head.* RS. *P.*
Sheep	0 12
Cows, bulls, assess and horses	0 25
Buffaloes	0 50
Elephants	5 00

608. Goats will on no account be licensed to browse or admitted into any of the reserves.

609. *Grazing possibility.*—A maximum grazing incidence of 5 acres (2.02 hectares) per cow unit as adopted in the past plan is prescribed for all the reserves. In calculating this incidence, areas closed to grazing for silvicultural or other reasons should be excluded. Where the demand for permits exceeds this incidence, preference in the issue of permits should be given to the cattle in villages adjoining the forest, provided permits are purchased within the first month of the grazing year.

610. *Agency of collecting grazing revenues.*—The grazing fees will be collected departmentally as per standard practice followed all over the State. The permits will be issued by the Range Officer and the concerned Foresters. Payment for permits must be made only to these officers either direcfly or by money order.

611. *Fodder grass.*—This item will continue to be leased out for commercial purposes along with other minor forest produce as at present with the proviso that cutting and removal free in head-loads by the public for *bona fide* domestic purposes by the ryots, by co-operative milk-supply unions and societies for the manufacture of silage will be permitted from the reserved forests except from coupes under felling or areas which are closed to grass cutting for silvicultural or other reasons. This concession was originally sanctioned in G.O. Ms. No. 227, Development, dated the 26th January 1938, in accordance with the recommendations of the Royal Commission in Agriculture in 1929, and modified from time to time. The removal of fodder grass free from the reserved forests will be under the following conditions :—

(i) Removals will be allowed only in head-loads for *bona fide* domestic use and for the use of the co-operative milk supply unions and societies. Removals in cart-loads will not be permitted. Removals for purposes of sale will be strictly prohibited.

(ii) No removal of grass shall be made in the areas closed to grazing.

(iii) Removals may be made throughout the year, but they shall not be made before dawn or dusk.

(iv) No permits will be required for grass removed in head-loads free of charge. It is considered that the introduction of permits may result in vandalistic practices by subordinates.

(v) No grass should be uprooted. It shall be cut with sickles. Grass collectors shall not carry bill-hooks or felling axes into the forest area; only sickles will be allowed.

(vi) Removals will be made only through the recognised footpaths or roads.

(vii) No forest produce will be cut to stiffen or tie the grass bundles.

(viii) No combustible material like matches or burning torches should be taken into the forest.

(ix) The head-loads of grass should be presented for inspection when demanded by any Forest Officer.

(x) The concession will be liable to be terminated to any particular individual or group of individuals in the event of serious breach of any or all of the conditions stipulated above.

SECTION 3—OTHER REGULATIONS.

612. *Grazing notification.*—A notification regarding grazing will be published in the District Gazette every year in the month of May specifying the areas closed to grazing, the conditions regulating the grazing, and the conditions under which free removal of fodder grass will be permitted in the different parts of the range.

613. *Demarcation of closed areas.*—All areas closed to grazing will be marked on the ground by means of red sign boards written in Tamil and in English in as many salient points as may be necessary.

614.—*Free grazing concessions to hill-tribes.*—The Irulas and Muduvars who hold leases of land inside the reserved forests are allowed free grazing for the small number of cows and bulls required by them for domestic and agricultural purposes, in return for the services rendered by them as detailed in the form of agreement entered into with each settlement. At present a total number of 69 cows and bulls, 12 buffaloes and 35 sheep are permitted to graze free in the forests. The break up for each settlement is given in paragraph 152 of Part I. This number may be suitably increased or decreased at the discretion of the District Forest Officer at the time of the annual renewal of the leases giving due consideration to the population of each settlement. The number now allotted free for each settlement will be found in the statement given under paragraph 152 of Chapter IV of Part I.

615. *Penning.*—Penning cattle within the reserved forests is allowed between the 1st of July and the 31st of December. Penning helps to distribute the incidence of grazing evenly over the whole area and should therefore be encouraged. Parties desirous of utilising a particular pen will obtain a penning licence which will be issued by the Range Officer.

616. A list of cattle pens now in use in the range is given below. Pens not included therein may be opened by the District Forest Officer, if he considers it necessary. Penning should not be allowed within the limits of the Fuel and Teak Conversion Working Circles.

LIST OF CATTLE PENS IN THE BOLAM PATTI RANGE.

Serial number and name of the reserve.	*Name of the pen.*
(1)	(2)
1. Bolampatti Block II	Kongaraipatti.
2. Bolampatti Block III	Kuppamedupatti.
3. Do. ..	Kilakupparaipatti.
4. Do. ..	Adiaparapatti.

SECTION 4—CONTROL.

617. The following control forms will be maintained by the District Forest Officer in the manner as prescribed in Section K under the chapter on Miscellaneous Regulations and should be posted at the cost of each financial year :—

(i) Control book.

(ii) Control journal.

(iii) Control maps.

618. The control maps should clearly show the areas closed to grazing and the penning sites commonly used.

CHAPTER VIII—MISCELLANEOUS REGULATIONS.

619. There are a number of subjects which cannot be legitimately treated under any of the previous working circles; neither can they be dealt with under separate working circles, as the areas are to be treated experimentally during the period of this plan (e.g., Sandal propagation centres), or about prescriptions on minor subjects which do not merit the formation of separate working circles.

A. Softwood Plantations.

620. There are at present 1,502·70 acres (608·12 hectares) of plantations of *Ailanthus excelsa* and *Salmalia malabarica* in the range. A tabulated list showing details of all the plantations is given in Appendix IV. The results of softwood planting have not been encouraging. No further planting of softwoods is therefore advocated. There are also no suitable areas in the range to extend softwood planting for the future.

621. The existing softwood plantations will be managed during the period of this plan as laid down below.

622. *Division of the area*.—All the softwood plantations in the range will be constituted into one series—The Bolampatti Softwood Series.

623. *Rotation*.—No definite data is available on the rate of growth of these species for the locality as the oldest plantation dates to only 1954. The question of rotation to be adopted for the softwood plantations will be left over for consideration at the revision of this working plan when a better idea of the rate of growth can be had.

624. *Regulation of the yield*.—Since none of the plantations raised so far would reach an exploitable girth during the tenure of this plan, no fellings are prescribed. Hence the question of regulation of the yield will not arise at present.

625. *Subsidiary Silvicultural Operations*.—(*a*) *Tending*.—The 1960 plantations will be tended and weeded during 1962–63. As the height growth is poor, two weedings including climber cutting will be done, the first weeding being done in June and the second in August.

Any further weedings beyond the third year may be done if necessary by the District Forest Officer after obtaining the special sanction of the Conservator of Forests.

A general tending during the fifth year will be carried out in all the plantations. This will include climber cutting and cutting back of damaged and malformed stems.

Any other silvicultural operations if necessary will be done by the District Forest Officer after obtaining the orders of the Conservator of Forests.

(*b*) *Thinnings*.—Even in the 1954 Regeneration Area which is the oldest plantation in the range, the canopy has not yet closed. Hence no thinnings are prescribed as it is not possible to foresee the rate of growth at present in the absence of any data. Thinnings if required for any plantation to a later date may be done by the District Forest Officer after soliciting the specific orders of the Conservator of Forests on the nature of thinnings to be done. The advice of the State Silviculturist may be sought at every stage.

626. *Other Regulations*—(*a*) *Defoliator control*.—*Ailanthus excelsa* is subjected to heavy defoliation by a noctuid insect, namely, *Eligma narcissus*. Defoliation is particularly virulent from December to February. The defoliation is often seen in epidemic condition and as many as 14 generations in a year have been reported to occur in plantations raised in Madhya Pradesh. Several insecticides have been tried so far, but all of them have proved to be not quite satisfactory. The best thing to do would be to remove the pupae hanging on the stems by means of a thick thread and bury them in small pits made in the earth. Collection of the larvae and killing them mechanically will help to reduce the incidence of the pest, but this is not advocated as it is not relished by the subordinates and mazdoors as a whole.

(b) *Control of shoot borer.*—Sporadic damage to young plants of *Poola* (*Salmalia malabarica*) by the shoot borer *Tonica niviferana* is seen in both the nurseries and in the younger plantations. The larvae riddle through the slender stem thereby making the plant susceptible to be broken by winds.

The damaged plants should be cut back at ground level in order to prevent stag-headedness from appearing. The affected plants should be piled together and burnt. As the damage is not widespread, no other special measures are called for its eradication.

(c) *Grazing.*—*Ailanthus excelsa* is not browsed by any animal, although it suffers from damage by trampling. *Salmalia* on the contrary is badly browsed by cattle and game alike and needs protection. It would be impossible to restrict the latter without a barbed wire fence the cost of which is exorbitant and is therefore not advocated. To protect this species from cattle, the plantations will be closed to grazing for a period of five years including the year of formation in the manner as prescribed in Chapter VII of Part II.

(d) *Fire protection.*—No special fire protection measures are necessary. The boundaries of the plantations will be cleared annually to a width of 10 feet (3.05 metres) which will serve as adequate fire lines and incidentally as inspection paths, too.

(e) *Plantation boards.*—None of the plantations raised so far have any plantation boards at present. It is prescribed that every plantation should be indicated at all salient points by suitable plantation boards showing the year of formation and the extent of the plantation.

(f) *Inspection paths.*—Permanent and properly graded inspection paths 6 feet (1·83 metres) wide running right across from end to end in the middle of each year's plantation should be laid out and they should be cleared of all growth annually to facilitate inspection.

627. *Control.*—A control book, record of works, control maps, plantation journals. nursery ledgers and control journals will be maintained in the manner as prescribed in Sections K and L of this chapter.

B. Planting of degraded areas.

628. The Ettimadai ex-panchayat forests and the lower reaches of the Ayyaswami North, Konamalai, Ichikuli and Marudamalai Blocks are practically devoid of any tree growth. Various attempts at regenerating large areas with regular fuel species in the past has met with only very patchy results. Except for a small plot of sissoo near Chinnamalai, the rest have not been successful. As the areas are extremely dry, regeneration with traditional fuel species is bound to be difficult.

629. Since it is extremely necessary to clothe these areas with some vegetation, it is suggested that a small area of 5 acres (2.02 hectares) annually is taken in each of these 3 beats and planted up with *Manjakonnai* (*Cassia siamea*). This species is bound to come up well as the black cotton soil of the locality overlying limestone is quite suitable for its growth. A small plot of 10 acres (4.05 hectares) of this species raised near Marudamalai temple has been quite successful. *Cassia siamea* is considered to be only a third grade fuel species, but since it would serve the purpose of clothing these areas with some vegetation which would not be possible with the traditional fuel species, it is recommended. The annual areas will be restricted to 5 acres (2.02 hectares) for each of the three beats,

Ettimadai, Karadimadai and Kempanur, so that the Forest Guard in charge of the beat can bestow individual attention to all the plants. The technique adopted will be as follows :—

630. As the areas are sloping, the 'trench and mound' technique will be adopted. Trenches 6 feet by 1 foot by 1 foot (1.83 metres by 091 metre by 0.91 metre) will be dug along the contour at an espacement of 22 feet (6.71 metres) from centre to centre with the trenches of the successive lines arranged in an alternating fashion to catch all the water that drains down the hill. The lines will be spaced at an interval of 22 feet (6.71 metres). The dug out earth will be thrown on the lower side of the trench so as to form a mound and stabilised by means of a few stones as illustrated in figures 3 and 4 in Chapter IV of Part II.

631. The areas referred to in this section receive precipitation mostly from the north-east monsoon. *Cassia siamea* seeds will be sown on the mounds at the onset of the north-east monsoon.

632. *Subsidiary regulations.*—The weedings, one late in November and another early in January will be done during the first year. The trenches will be mended at the same time

633. During the second year, two weedings, one in September—October a little prior to the setting of the north-east monsoon and another in January will be carried out, with the trenches mended at the same time. Fresh sowings will be made on mounds where stocking is insufficient.

634. *Other regulations.*—The regeneration areas will be fenced by means of a thorn fence, and closed to grazing for a period of five years including the year of planting.

635. Plantation journals will be maintained for the regeneration sites in the manner as prescribed under Section K.

C. Sandal Propagation Centres.

636. A sprinking of sandal is seen in the Singapathy and Sadivayal Blocks. These trees are said to have spread from seeds originally dibbled by students of the Madras Forest College. The heartwood content of the sandal is comparatively less than in the typical sandal areas owing to the moister conditions prevalent here, but it is appreciable to note that the trees are free from spike. Hence it is extremely desirable to increase the proportion of this valuable species by means of artificial work.

637. The technique of raising sandal plantations has not been sufficiently developed to warrant the prescription of regular sandalwood plantations. Attempts will be therefore made to raise sandal in small propagation centres. This method has proved quite successful in establishing sandal in portions of Tirunelveli district.

638. The general object of artificial regeneration of sandal by the method of propagation centres is to ensure its spread over as wide an area as possible.

639 The chief essentials in the selection of a site for propagation centres are—

(*a*) Sufficient moisture in the soil. Stream banks are therefore particularly indicated.

(*b*) The presence of vigorous trees to act as hosts.

(*c*) Sufficient lateral shade.

640. The areas selected are noted in the table below :—

Name of the beat.	*Locality.*
(1)	(2)
1. Mullangadu beat .. — —	At Ayerpathy along the northern bank of the Noyil River.
2. Poondy beat	Along the southern bank of the Nilivaikkal.
3. Do.	Near Kallarpathy along the banks of the Kallar River.

641. The areas selected have been marked on the management maps.

642. *Technique.*—Clearings 10 feet by 10 feet (3.05 metres by 3.05 metres) at the rate of two per beat will be made in the middle of a clump of trees and bushes. The cut materials should be piled up evenly over the clearing and burnt in March–April taking care to see not to damage the standing growth of trees and larger shrubs. The resulting ash should be mixed with the soil by raking it and the little plot fenced adequately against game and cattle.

643. Early in May, shallow saucer like depressions 5 inches (12.70 centres) in diameter at an espacement of about 3 feet by 3 feet (0.92 metre by 0.92 metre) will be made in the plot and a layer of good sandal seeds 10–15 in number dumped in them. This layer will be covered with damp straw or moist humus. *Dhal* (*Cajanus indica*) seeds may with advantage be broadcast sown in the areas simultaneously in order to provide hosts for the young sandal seedlings. The clumps should be watered twice a week in case there is no rainfall. Occasional watering will be also necessary during the break between the south-west and north-east monsoons when the climate would be dry. Rodents are particularly fond of sandal seeds and it is possible that all the seeds in the dumps may be eaten by them. To obviate this danger, seedlings may be raised in bamboo baskets by Beat Guards near their headquarters and used to replace casualties. Sandal seeds, once they germinate are not attacked by rodents.

644. Periodical aeration of the soil by forking is advisable but care should be taken to see that this is done under proper supervision so that the delicate haustorial attachments of the sandal on its host are not disturbed. Full stocking in the first year will be secured by replacement of casualties, during the north-east monsoon wherever necessary. Survivals will be enumerated in May for two years following the year of formation and the results recorded in the propagation centre journal which will be maintained for this purpose. A map showing the position of all such centres will also be affixed to the concerned page of the journal.

645. *Seed collection.*—All seed required for regeneration operations will be collected from local healthy seed bearers. Seeds from other divisions should on no account be imported owing to the possibility of introducing spike disease with it. This is a matter of great importance and the prescription must be carefully observed.

646. Fresh ripe fruits be collected from vigorous well grown trees with thick dark green leaves. The outer skin and pulp from the seeds should be removed as soon as possible after collection by macerating the fruit in water. The seeds should be carefully dried in the sun and sown with the minimum of delay. If storage is found necessary, the seeds should be stored in air-tight tins.

D. BOUNDARIES.

647. *External boundaries.*—The clearing and maintenance of the outer boundaries of the forest of the range shall be the work of the local beat subordinates as in the past. The cairns or pillars on the boundary lines should be kept in a state of good repair. Missing cairns should be reconstructed with the aid of the corresponding reserve maps and serially numbered for each reserve forest.

648. The top boundary of the Bolampatti Blocks II and III delimiting the forests of the range with the Kerala State and the Coimbatore North Forest Division need not be cleared. The inter-state boundary which was formed as a district boundary between Coimbatore and Malabar is now overgrown, and its demarcation and maintenance considering the fact that it is a watershed boundary about 30 miles (48.28 kilometres) in length at an elevation of over 3,000 feet (915 metres approximately) and more is not a practical proposition.

649. *Internal boundaries.*—Practically in all the settlements, the hill tribes have encroached beyond the limits of the land granted to them at the original settlement. Lack of maintenance of boundaries is the sole reason for this. The settlements should be surveyed and encroachments, if any, regularized and the corrections posted on the management maps. The boundaries of all the settlements should be got cleared annually by utilizing the hill tribes of the particular settlement at their own cost, the boundaries checked and a certificate to that effect submitted by the Range Officer to the District Forest Officer.

650. *Rectification of discrepancies.*—Mention has made in paragraph 25 of Part I of the existence of several discrepancies and minor encroachments along the outer boundaries of the Ettimadai ex-panchayat forests. A few discrepancies have been noticed along the boundary as it exists on the ground and as is represented in the Survey of India maps in the case of the Ayyaswami South Block also. The existing boundary should be carefully checked with the section 16 notification by a Gazetted Officer and either rectified or re-notified, depending on the degree of difference actually observed.

651. Early steps should be taken to define precisely the limits within which certain rights could be exercised round admitted temples and shrines as granted at Forest Settlement (vide paragraph 27 of Chapter I of Part 1).

E. Fire Protection.

652. The following fire protection measures will be carried out :—

(i) Fire tracing around all plantations three years old and below.

(ii) Fire tracing around all buildings and timber depots inside reserve forests. These lines should be swept clear at intervals throughout the fire season.

(iii) Fire tracing of either side of the railway line passing through the Sholakarai Block.

(iv) Fire tracing the lines around Poondy and Vellingiri temple enclosures and the bridle path leading to it.

653. In addition to the fire protection measures prescribed above, clearing of the existing forest roads, cart-tracks and bridle paths within the range have been prescribed in paragraph 661. These roads and paths will also serve as efficient fire breaks.

654. The annual clearing of the external boundaries of the forests by the subordinate staff should be insisted upon as prescribed in paragraph 647. These will to a certain extent prevent the entry of fires from the surrounding *patta* lands and unreserves.

655. *Fire patrols.*—One fire patrol will be employed per beat for three or four months depending on the length of the dry season wherever absolutely required. The fire patrols should be employed judiciously and three or four of them should be concentrated, if necessary, on the pilgrim path from Poondi to Vellingiri during the festival season.

656. *Closure of fire burnt areas.*—The maintenance of fire lines and fire patrols, however, cannot by themselves put a stop to fires in areas where grazing prevails as is the case in the forests under consideration. A majority of fires are caused by graziers who burn the forests for the sake of the flush of tender grass which comes up with the

first rains after a burn. Such wilful burning can be checked only by removing the temptation to burn by closing the burnt tract immediately to grazing as a silvicultural measure intended to enable the area to recover from the damage caused by the fire to the trees. It must be borne in mind that the closure should be applied before the new flush of grass shoots forth so as to deprive the culprits of their objective.

657. Pens may be closed by the District Forest Officer if areas adjoining them have been severely burnt. No refund of penning fees can be claimed in such cases.

658. *Fire fighting.*—As soon as a fire is noticed, no matter what the time, the Forest Guard and the Watcher will collect the village officials and contractor's coolies from the nearest village and proceed to the spot and extinguish it by beating it out with branches or by counter-firing, if necessary. Very often subordinates are prone to dismiss a fire as a harmless occurrence that would subside down after sometime without realizing the direct and indirect damages done to the forest. In order to sufficiently impress on the subordinate staff the seriousness of a fire, the Range Officer should take personal interest in putting down all fires that come to his notice. This apart from instilling into the subordinates the necessary confidence, would go a long way in putting down fires before much damage is done.

659. An investigation into the cause of every fire should be made, and if it is due to incendiarism no pains should be spared to detect and convict the offender. A few such judicious prosecutions will bring round recalcitrant villagers to a sense of their responsibilities regarding the damages caused to the forest by fire. Forest subordinates who have detected such offenders and secured their conviction in a court of law should be given monetary rewards as an encouragement. The amount of such reward will be decided by the territorial Conservator.

660. *Control.*—The following control records will be maintained by the District Forest Officer.

(*a*) *Fire control journals.*—This will contain complete information on the following points :—

(i) Areas closed to grazing on account of fire.

(ii) Name and length of fire lines burnt with costs.

(iii) The incidence of fire in each reserve in the form of a tabular statement showing—

(*a*) Total area of reserve;
(*b*) date of fires;
(*c*) area burnt;
(*d*) probable causes of fire; and
(*e*) percentage of area burnt to which special protection is accorded.

(iv) Observations of the District Forest Officer on the adequacy or inadequacy of the fire protection measures prescribed with reasons.

(*b*) *Fire maps.*—All fires will be marked on a map drawn to a scale of four inches = 1 mile (1 centimetre—.1584 kilo metres). Serial numbers will be given to all the fires in chronological order. One set of fire maps will be used for five successive years, fires of each year being distinguished. Particular emphasis is stressed on the proper maintenance of control records, as not even fire statements seem to have been maintained in the range during the last decade.

F. Roads.

661. A list of existing roads, cart-tracks and bridle paths in the range is given in Chapter V of Part I. All of them will be maintained. During the annual repairs to the roads, progressive improvement of the roads in width and surface should be aimed at. The maintenance of a good system of drainage is essential and is economical in the long run. The roads should be also kept free from inflammable material so as to serve as efficient fire breaks.

662. Since the Chavadipara Road feeding the Waterfall Block is connected to the Coimbatore–Palghat highway after passing through the Varalapadi forests (which are now in Kerala State) it is suggested that the Sengalpallam Road bordering the eastern boundary of the Sholakarai Block be extended all along the reserve boundary to connect the Waterfall Block. This will incidentally facilitate fuel and bamboo coupe contractors to remove their produce by lorries through a shorter route and at the same time obviate the necessity of inspecting officers visiting the Waterfall Block after passing through Kerala State Forests by a circuitious route.

663. The Adivaram-Muthikulam Road is now only a fair weather road. Side drains, culverts and revetments are badly lacking and many of the bends are too narrow. Substantial improvements to this road are necessary. This road is required for our own use and for facilitating sightseers visiting Siruvani Dam. A contribution towards the improvements to be made may be obtained from the Kerala State Forest Department and the Municipality, as is being done now for the annual maintenance of the road.

664. There is at present a cart-track connecting the Iruttupallam-Chinnar Road with the Kalkothipathy 1944 teak plantation which at places passes through *patta* fields. It is suggested that this track be acquired and improved to form a road connecting the Kalkothipathy plantation and also extended along the foot of the hill up to Valakaradu in Mangalapalayam East beat. Such a road will facilitate transport of thinned produce from the Kalkothipathy plantations and fuel and bamboo from the Mangalapalayam West and East beats.

665. It is also prescribed that the existing cart-track above the softwood plantations from Adivaram up to Poondi be widened and improved to form a *pukka* road. This road passes through the Poondi Fuel Series and will facilitate extraction of fuel and bamboos from the forest along the hill-slopes.

666. Formation of cart-tracks from the selection felling coupes to the main feeder roads wherever necessary is also suggested.

G. Buildings.

667. A list of buildings in the range is given in Chapter V of Part I. All buildings shall be kept in a state of repair.

668. *Residential accommodation.*—Several of the subordinates of the range lack residential facilities. For the efficient protection of the forest, the executive subordinates require housing facilities as suitable private quarters are not often available, or are beyond the reach of the average Forest Guard and Reserve Watcher in these days of soaring prices. It is therefore suggested that suitable quarters be constructed during the period of this plan for such of these beat subordinates not provided with quarters at present. The following statement gives particulars of the subordinates of Navakkarai Section in need of quarters and their headquarters where suitable buildings can be constructed :—

1. Reserve Watcher, Modamathi beat, Navakkarai.
2. Forest Guard, Sholakarai beat, Sholakarai.
3. Reserve Watcher, Sholakarai beat, Sholakarai.
4. Forest Guard, Koochimalai beat, Sholakarai.
5. Reserve Watcher, Koochimalai beat, Sholakarai.
6. Special Forest Guard. Koochimalai beat, Sholakarai.

669. Quarters for the Forest Guards and Reserve Watchers of Sholakarai and Koochimalai beats may be constructed at a suitable place in the small Sholakarai Reserved Forest close to the road. The Forest Guard's quarters at Navakkarai now occupied by the Forest Guard, Sholakarai beat should be allotted to the Forest Guard, Modamathi beat. A building for the Reserve Watcher, Modamathi beat is necessary and may be put up in the Navakkarai Forest Colony Compound.

670. Quarters are required for the 2nd Range Clerk. This may be built in the Iruttupallam Forest Colony itself. Quarters for the Forester, Narasapuram Section and the Forest Guard, Narasapuram beat are also necessary. These may be constructed in the poramboke lands adjacent to the Narasapuram Reserve Watcher's quarters which is now lying vacant and may be available for this purpose. A well should be sunk at this site.

671. Quarters for the Forest Guard and Reserve Watcher of Poondy beat may be built at Poondy itself close to the temple which has a colony of its own.

672. Quarters for the Forester, Karadimadai Section, Forest Guard and Reserve Watcher of Karadimadai beat may be constructed at Karadimadai and for the Forest Guard and Reserve Watcher of Mangalapalayam East beat at Mangalapalayam or at Mathipalayam in suitable poramboke lands if available, or in lands specially acquired for the purpose, the choice of the site being guided by availability of a perennial water-supply. The existing building at Iruttupallam Range Colony now allotted to the Forest Guard, Mangalapalayam East beat may be allotted to the Reserve Watcher, Mangalapalayam West beat who does not have quarters.

673. Iruttupallam is more than six miles from the nearest boundary of Mangalapalayam East beat and the building is now not occupied by the Forest Guard.

674. Quarters for the Forest Guard and Reserve Watcher, Kempanur beat may be built at Dhaliyur in some poramboke land if available or in some land specially acquired for this purpose.

675. None of the special duty staff in charge of planting work at Mullangadu are now provided with any quarters. Suitable quarters with a well may be constructed for them at Sadivayal close to the Forest College camping ground.

676. The subordinates' lines at Vellapathy and the Forest Guard's quarters at Poondy allotted to Mullangadu beat are not occupied. This should be insisted upon by the District Forest Officer and disciplinary action taken if necessary since neither of these quarters are in any forlorn locality, the former being close to the Vellapathy Irular Settlement and the latter close to the Poondy village where there is a miniature village itself.

677. *Rest Houses.*—Before " States' Reorganisation " the Walayar Rest House used to be the camping place for inspecting the forests of Navakkarai Section. Now that the Walayar Rest House is transferred to Kerala State, the Navakkarai forests have to be inspected from Coimbatore as there is no other suitable camping place in between. Inspecting these forests from Coimbatore is extremely arduous and inconvenient for officers not provided with vehicles, as the buses plying on the route run houseful from Palghat to Coimbatore and it is seldom possible to secure accommodation at the intervening stations. It is therefore suggested that a rest house be built in the Navakkarai Forest Colony. There is adequate space for constructing a rest house in the colony grounds.

678. Since the old Koil Rest House was abandoned, there is no camping place to facilitate inspections of Narasapuram section. The forests of this section will have to be therefore from Iruttupallam or Coimbatore. It is therefore suggested that a small rest house be constructed at Narasapuram. Poramboke lands are available adjoining to the newly constructed Reserve Watcher's quarters for this purpose.

679. The Mylon's Bungalow on the Adivaram–Muthikulam Road is said to have been constructed by a Municipal Contractor for his personal use during the construction of the Siruvani Dam and left behind by him. The Coimbatore Municipality has been treating it as its property which sounds rather illogical as the building stands as a solitary structure in the reserve forest. The area occupied by the Rest House does not even stand leased to the Municipality. It is of little use to the Municipal staff as a rest house. A few of the public camp here occasionally when they come on sight seeing. Forest Officers cannot afford to camp in this rest house as the daily rent of Rs. 2·50 is rather exhorbitant for a Grade V Officer, and even more for the Range Officer, although

it is an ideal site for inspection of the upper slopes and is a delightful spot for camping during the hot weather. It can be improved further to serve as a picnic site for sight-seers from Coimbatore. It is therefore suggested that the Municipality be addressed through the Government and the building taken over for use as a Forest Rest House.

680. *Electrification of the Range Colony at Iruttupallam.*—Since electricity has now reached Iruttupallam, electrification of the Range colony and the Forest Rest House will not present any difficulty and should be executed as quickly as possible.

681. *Water-supply.*—Water-supply for the rest house and the forest colony at Iruttupallam is at present unsatisfactory. The well water is not safe from contamination, being too close to the Noyil River whose waters are mostly stagnant during dry whether. The main pipe line supplying water to Coimbatore passes very close to the colony and it is very desirable that this source of supply is made available for the forest colony and the Officers camping at the rest house. The laying of a pipe line from the mains and the provision of two or three taps was suggested by Venkateswara Ayyar, but it is unfortunate that the prescriptions were never carried out even to this day. It is suggested that the pipe line may be laid out atleast during the period of this plan.

682. *Sanitary arrangements.*—Most of the existing subordinate quarters do not have any latrines at all. The building of septic tank latrines to all these buildings is considered essential.

H. Rain guages.

683. The maintenance of rain-gauges and recording of rainfall stations in the past leaves much to be desired. The rain guages at Sengalpallam and Vellapathy have been dismantled long since and no attempts have been made to reconstruct them. Rainfall statistics have not been recorded for several years, and it is a matter of surprise that recordings from the rain-guage at Iruttupallam which is next door to the Range Office should go as default.

684. The existing rain-gauges will be maintained. The rain-gauge at Sengalpallam will be reconstructed. A simple planter's type of rain-gauge will do. The rain-gauge at Vellapathy need not be rebuilt as the new gauge erected at Sadivayal will suffice.

685. The proper maintenance of rainfall statistics at the existing and the proposed stations is stressed. The measurements of rainfall should be taken preferably by a Forester at weekly intervals. A monthly statement of rainfall at the stations must be submitted to the District Forest Officer by the Range Officer.

I. Timber Transit Rules.

686. The special rules to regulate the transit of timber in the Palghat Forest Division are in force in the range. As the major portion of Palghat Division has been transferred to the Kerala State following 'States Reorganisation', there is no need to maintain a special set of rules for this small area now. The General Timber Transit Rules of the State which are enforced in the rest of Coimbatore district should be made applicable to this range by addressing the Government.

687. A considerable quantity of timber, fuel, bamboos, reeds, canes and minor forest produce from the Attapadi Block VI forests in Kerala State and some of the adjacent private estates come down to Coimbatore through the Siruvani-Coimbatore Road. In order to safeguard our forests from possible theft, it is suggested that the old *tanah* at Thombilipalayam be revived by appointing a Forest Guard, so that an effective check on all timber in transit can be made.

688. A similar *tanah* at Navakkarai near the forest colony to check the forest produce coming from Kerala along the Palghat–Coimbatore Road is also suggested.

J. TAPAL ARRANGEMENTS.

689. Iruttupallam is now served by the Coimbatore 10–Sub-Post Office at Perur. Tapals are delivered at Iruttupallam once in three days causing considerable delay. The postman is said to reach Alandurai every day, and tapals can be obtained daily only if the Range Peon is sent to Alandurai to receive the tapals. This would not be always possible and delivery of registered letters which will have to be done to either the Range Officer or the Range Clerk are inordinately delayed. It is therefore suggested that the District Forest Officer addresses the postal authorities to instal a Sub-Post Office at Alandurai which is a fairly big village and is just two miles from Iruttupallam in order to expedite delivery.

K. CONTROL.

690. The control records and maps which are to be maintained in the District Forest Office have been dealt with under the various working circles. The posting and maintenance of control records and maps is a matter of vital importance and must receive the personal attention of the District Forest Officer. Special emphasis is laid on this, because the maintenance of control records in the past have not been satisfactory.

691. *Control book.*—This register will show all operations actually carried out in connection with the exploitation in each felling series as per prescriptions of the working plan, as well as such measures as are neither prescribed nor suggested but are carried out.

692. *Record of works.*—All works carried out under the prescriptions for recommendations of the working plan as well as such measures as are neither prescribed nor suggested but are carried out, will be recorded in this form.

693. *Register of deviations.*—This is a register showing every case of deviation from the prescription of the working plan, the need for the deviation, and the authority by whom it was sanctioned.

694. It is suggested that the Control Book, Record of Works and the Register of Deviations be maintained separately for each working circle. A list of the control forms to be maintained for each working circle is given in Appendix VIII.

695. *Control maps.*—The Control Map will show on a 4 inches=1 mile (1 centimetre =.1584 kilometre) scale the areas proposed for working every year, the areas actually worked, areas regenerated annually, if any, with the name of the species planted or sown and with the dates of original planting.

696. *Control journals.*—The control journal will give a detailed account of the management of the range. The object of this journal is to secure a running commentry on all objects of administration, specially on the extent to which the objects of the working plan have been realised, and the extent to which the methods prescribed have been found suitable, successful and economical and such information as is not available in the Control Book and the Record of Works. The journal is intended to give the District Forest Officer, an opportunity for recording suggestions for modifications and improvements in the methods of working laid down in the working plan. If it is maintained, it should be of great help when the plan comes to be revised. The journal should therefore be taken into camp by the District Forest Officer and critical observations should be recorded in it during or after inspection.

697. It is suggested that the Control Journal be maintained separately for each working circle. A summary of annual revenue and expenditure in a form to facilitate comparison with the financial forecast in this plan, will be also recorded every year.

698. The control journal is a technical record and must be maintained personally by the District Forest Officer or his Gazetted Assistant. A copy of the entries made during the year should be submitted to the Conservator of Forests, Coimbatore Circle, soon after the close of each financial year along with a copy of the deviation statement, the control forms and map.

L.—PLANTATION AND NURSERY JOURNALS.

699. In addition to the control forms prescribed under the previous section, plantation and nursery journals should be maintained wherever artificial regeneration operations are involved.

700. *Plantation journal.*—A plantation journal will be maintained for each plantation showing its location, area, a sketch of the plantation on a scale of 16 inches to a mile (1 centimetre—.03963 kilometre), the nature of the previous growth, the revenue obtained if any by clearing the growth, the details and cost of formation of the plantation, and further history like thinnings, defoliator control, etc.

701. *Nursery ledger.*—A nursery journal will be maintained for each year's nursery showing its location, number and size of beds, species sown, seed-origin, date of sowing, nursery technique adopted, watering regime, cost of maintenance, etc.

702. Both the plantation and nursery journals will be maintained personally by the Range Officer.

703. Inspecting officers will note their remarks on these journals which will be replied to by the Range Officer.

704. Copies of these journals will be maintained at the District Forest Office also. Proper maintenance of plantation and nursery journals is emphasised since they were not done satisfactorily in the past.

CHAPTER IX—ESTABLISHMENT AND LABOUR.

SECTION 1—ESTABLISHMENT.

705. *Territorial staff.*—The existing scale of territorial staff provided for the range is quite adequate and no change is therefore advocated.

706. No change is also necessary from the existing division into sections and beats as the sub-division works quite satisfactorily.

707. *Special staff employed for plantation work.*—At present one Forester and five Forest Guards are employed for implementing the softwood scheme. With no more softwood planting, there is no necessity to have this staff, except for a Forest Guard for the maintenance of the plantations already raised. Of the others, one Forester, and two Forest Guards will be utilised in the works connected with 100 acres (40.47 hectares) of teak planting annually prescribed under the Teak Conversion Working Circle. The excess of two Forest Guards will be retrenched.

708. *Menials.*—The Iruttupallam Forest Rest House is a frequent camping place for officers. The bungalow has at present no attendant to keep it clean daily and this work is now being attended to by the beat subordinates. It is suggested that a full-time bungalow watcher be appointed for this rest house.

709. *Tanahdars.*—If the proposals to instal a *tanah* each at Navakkarai and at Thombilipalayam as suggested in Chapter VIII are implemented, two Forest Guards would be necessary for working as Tanahdars.

SECTION 2—LABOUR.

710. There is no dearth of labour in the Bolampatti and Walayar Valleys and no special provision is therefore necessary.

711. The Irulars and Muduvars of the Bolampatti Valley are tenants of the department. Their services have been secured for all forest works by means of grants of land inside the reserved forests under agreement. As suggested in Chapter II of Part II, the hill tribes should be encouraged and preferred to the local labour in the allotment of lands for *ponam* cultivation in the regeneration areas. This would be both in the interest of our regeneration works and in the amelioration of the hill tribes. A sympathetic but firm attitude towards these hill tribes will be of mutual benefit. The Range Officer should cultivate personal contact with the hill tribes.

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CHAPTER X—FINANCIAL FORECAST AND COST OF THE WORKING PLAN.

SECTION 1—FINANCIAL FORECAST.

712. The following statements show :—

1. The estimated revenue and expenditure in respect of each working circle for the period of this plan; and

2. An abstract of the forecast.

(1) *The Teak Conversion Working Circle.*—

Year.	*Revenue in rupees.*	*Expenditure in rupees.*
(1)	(2)	(3)
1962–63	26,005	17,875
1963–64	20,270	8,590
1964–65	24,260	10,420
1965–66	22,055	9,780
1966–67	21,430	13,230
1967–68	20,975	11,425
1968–69	23,305	12,530
1969–70	3,015	12,470
1970–71	3,600	7,350
1971–72	6,770	9,505

The decrease in revenue during the later years is due to lack of suitable areas for conversion. Hence there will be no revenue during these years from sale of clearfelling coupes. The increase in expenditure during 1962–63 is on account of the thinnings proposed in the plantations that have not been thinned properly in the past.

(2) *The Selection Working Circle.*—

Year.	*Revenue in rupees.*	*Expenditure in rupees.*
(1)	(2)	(3)
	RS.	RS.
1962–63	36,190	14,500
1963–64	31,890	25,920
1964–65	25,510	27,400
1965–66	31,300	26,320
1966–67	32,630	25,800
1967–68	39,610	29,400
1968–69	31,880	30,230
1969–70	36,890	29,330
1970–71	36,280	29,550
1971–72	39,725	30,060

(3) *The Fuel Working Circle.*—

1962–63	89,240	280
1963–64	88,340	6,065
1964–65	87,940	6,700
1965–66	88,940	6,700
1966–67	87,940	6,700
1967–68	87,840	6,700
1968–69	88,140	6,700
1969–70	85,740	6,700
1970–71	95,740	6,700
1971–72	85,940	6,700

The decrease in expenditure during the first year is on account of no regeneration being undertaken during this year.

(4) *The Bamboo Working Circle.*—An annual income of Rs. 38,060 is expected. No expenditure is anticipated.

(5) *The Minor Forest Produce Working Circle.*—An annual revenue of Rs. 15,400 and an annual expenditure of Rs. 120 are anticipated.

(6) *The Grazing Working Circle.*—An annual revenue of Rs. 4,300 and an annual expenditure of Rs. 15 are expected.

(7) *Miscellaneous.*—

Year.	*Revenue in rupees.*	*Expenditure on rupees.*
(1)	(2)	(3)
1962–63	2,780	29,980
1963–64	2,780	18,050
1964–65	2,780	18,050
1965–66	2,780	18,060
1966–67	2,780	17,650
1967–68	2,780	17,650
1968–69	2,780	17,650
1969–70	2,780	17,650
1970–71	2,780	17,650
1971–72	2,780	17,650

The increase in expenditure during 1962–63 is on account of the weeding and tending operations proposed for the younger softwood plantations.

(8) *Establishment.*—The expenditure towards establishment will be annually Rs. 38,200. This will include one-sixth of the share of charges of the District Forest Officer and his office at Pollachi.

(9) *Abstract of the forecast.*—The total revenue and expenditure for the whole division for each year is estimated as follows :—

Year.	*Revenue in rupees.*	*Expenditure in rupees.*	*Surplus in rupees.*
(1)	(2)	(3)	(4)
1962–63 ..	2,11,975	1,00,970	1,11,005
1963–64 ..	2,01,040	96,960	1,04,080
1964–65 ..	1,98,250	1,00,905	97,345
1965–66 ..	2,02,835	99,195	1,03,640
1966–67 ..	2,02,540	1,01,715	1,00,825
1967–68 ..	2,08,965	1,03,510	1,05,455
1968–69 ..	2,03,865	1,05,445	98,420
1969–70 ..	1,86,185	1,04,485	81,700
1970–71 ..	1,86,160	99,585	86,575
1971–72 ..	1,92,975	1,02,250	90,725

The foregoing abstract of estimated revenue and expenditure does not include the proportionate share of charges on account of the Conservator of Forests, Coimbatore Circle, and his office.

SECTION 2—THE COST OF THE WORKING PLAN.

713. The cost of preparation of this working plan is given below :—

	Expenditure incurred.
	RS. P.
Pay of Officer	5,166.04
Pay of Establishment	7,126.79
Dearness Allowances	1,817.26
Travelling Allowances	2,219.73
Fixed Travelling Allowances	798.52
Other Compensatory allowances	663.05
Contingencies including pay of Office Watcher ...	2,034.85
Working plan works	860.83
Total ...	20,687.07

714. One Working Plans Officer in the category of an Assistant Conservator of Forests in the Madras Forest Service, one Ranger, two Foresters, one clerk and three peons, generally formed the establishment of the working plans division.

Summary of Prescriptions.

CHAPTER I—BASIS OF PROPOSALS.

PARAGRAPHS.

Objects of management.—The objects of management are briefly—

(i) To conserve the forests forming the catchment areas of all the important streams and rivers in the interest of water-supply, etc ... ...

(ii) to protect the forests from fire and man ... ...

(iii) to enhance the value of the forest by raising teak plantations in suitable areas, and tend the plantations already raised ... ...

(iv) to extract the mature teak, rosewood and other merchantable species occurring in the upper slopes of Bolampatti Blocks I and II Reserved Forests and to regenerate in the gaps caused by felling ... ...

(v) to exploit, subject to silvicultural principles, the resources of the forest in firewood, small timber, bamboos and minor forest produce ... ...

(vi) to tend the softwood plantations already raised ... ...

(vii) to provide grazing facilities to the local populace ... ...

(viii) to provide the domestic needs of the hill tribes ... ...

Paragraphs.

Working Circles.—The following working circles have been constituted :— 318

(1)	Area in acres (Hectares.). (2)
1 The Teak Conversion Working Circle.	1,763·02 (713·47)
2 The Selection Working Circle.	6,000 (2,428·14)
3 The Fuel Working Circle ..	11,681 (4,727·18)
4 The Bamboo Working Circle ..	36,458 (14,754·19)
5 The Minor Forest Produce Working Circle.	All the reserves and unreserves within the range.
6 The Grazing Working Circle ..	All the forests of the range excepting the areas specifically closed to grazing.

Period of the working plan.—This working plan will be in force for a period of 10 years from 1st April 1962 to 31st March 1972. Indications regarding the areas to be worked in the succeeding five years have also been made in case there happens to be any delay in taking up the revision before the plan lapses 319

Blocks and compartments.—The whole range is divided into 19 blocks in order to facilitate identification of the localities 320

Subdivision of the blocks into compartments is not made in view of the reasons explained 321

CHAPTER II—THE TEAK CONVERSION WORKING CIRCLE.

General constitution of the working circle.—This working circle includes all teak and hardwood plantations raised in the Bolampatti Range, and the areas proposed for conversion ... ... 322 and 323

Area.—The area of the working circle is 1,763.02 acres (713.47 hectares) of which 550.01 acres (222.58 hectares) are now covered with existing teak plantations 324

Division of the area.—The area will be divided into two felling series.

Details of areas included under each felling series are given 327

Analysis and valuation of the crop.—Detailed stock maps of the teak plantations and the areas proposed for conversion accompany this plan ... ... 328 and 329

Silvicultural system.—The silvicultural system adopted will be the clearfelling system followed by concentrated artificial regeneration 331

Choice of species.—Teak will be introduced over the entire area. In swampy patches, Karumarudu (*Terminalia tomentosa*) will be planted. Rosewood (*Dalbergia latifolia*) and Vengai (*Pterocarpus marsupium*) will also be introduced in areas otherwise unsuitable for teak on an experimental scale to start with ... ... 332 and 333

Rotation.—The rotation is fixed at 60 years and the reasons therefor are given ... 334 to 336

Regulation of the yield.—As no fellings are prescribed during the period of this plan, the question of regulation of the yield will not arise at present 337

Annual regeneration area.—The necessity for converting all suitable areas into teak plantations at an early date is elucidated. An area of not less than 100 acres (40.40 hectares) will be planted annually ... ... 338 and 339

	Paragraphs.
Method of executing fellings.—The annual coupe will be demarcated by means of cleared lines 6 feet (1.83 metres) wide	341
The coupes will be exploited through the agency of contractors	342
The period of lease will be for 9 months starting from the 1st of April	343
The details of the system of exploitation are given	344 and 345
A detailed statement of the areas to be felled and planted each year is given ...	346
Regulation of regeneration operations.—As far as possible, all plantations will be raised by the *ponam method*	348 to 351
The felling slash and regrowth will be cleared during February–March and burnt uniformly before the end of March	352
Aligning and staking at 6 feet by 6 feet (1.83 metres by 1.83 metres) will be done.	353
One year old stumps will be planted with the onset of the pre-monsoon showers usually between the 15th of May to the 15th of June	355
Nursery.—Nurseries will be raised for raising stumps of teak, *Karumarudu* (*Terminalia tomentosa*), rosewood (*Dalbergia latifolia*) and *Vengai* (*Pterocarpus marsumpium*). The details of nursery technique are given	359 to 374
Subsidiary silvicultural operations.—Details regarding the replacement of casualties, weeding and tending operations to be done in order to establish the young teak are given.	375 to 382
Thinnings.—The first two thinnings will be mechanical. The subsequent thinnings will be selective	383 and 384
Thinnings will be done in the 5th, 10th, 18th and 28th years of the plantation. The conditions under which thinnings are to be done are laid down	386
For the mechanical thinnings, the thinning degree will be expressed as an S percentage of the top height. For the silvicultural thinnings, C/D grade will be the maximum degree prescribed	387 to 392
The marking rules for thinning are laid down	393 to 399
A tabular statement showing the areas to be taken up for thinnings during the ten years of the plan is given. Particulars of plantations to be thinned in the succeeding five years in case there is delay in revision are also given	400 to 405
The thinned produce will be converted into timber, poles and fuel stacks. The details of conversion are given	406 to 409
Other regulations.—The maintenance and renewal, if any, of plantation boards are prescribed	410
Formation of inspection paths and their annual maintenance in every plantation are prescribed	411
All plantations will be closed to grazing for a period of six years including the year of felling	413
Maintenance of surveyed sketches of future plantations is prescribed in order to aid the next revision	414
Control.—The control records to be maintained are indicated	415

CHAPTER III—THE SELECTION WORKING CIRCLE.

	Paragraphs.
General Constitution of the Working Circle.—This working circle includes all the mixed deciduous forests along the upper slopes of Bolampatti Blocks I and II Reserved Forests containing an appreciable quantity of exploitable timber	416 and 417
Area.—The total area of the working circle is 6,000 acres (2,428.14 hectares) of which the net area is 5,310 acres (2,148.90 hectares)	418
Division of the area.—The area will be divided into two felling series. Details of areas included in each felling series are given	421
Silvicultural system.—The system adopted will be the 'Selection System' whereby mature trees over an exploitable girth limit fixed shall be removed	425
Artificial regeneration will be provided in the gaps caused by felling	426
Choice of species.—Teak, rosewood, venteak, *Vengai* and *Pillamarudu* shall be extracted	427
Extraction will be extended to other merchantable species also if there is any demand	427

Exploitable girth.—The following minimum exploitable girth limits are fixed for the different species :—

(1) Rosewood (*Dalbergia latifolia*)—8 feet (2.44 metres).

(2) Teak (*Tectona grandis*)—5 feet (1.22 metres).

(3) Other species—6 feet (1.83 metres).

The distribution of the number of exploitable trees of the various species under each series is given	428 to 434
Rotation.—The rotation is fixed at 120 years	435 and 436
Felling cycle.—A felling cycle of 20 years is adopted	437
Regulation of the yield.—The yield will be regulated by area	438
Method of executing fellings.—The marking, felling and extraction will be done departmentally	439
The marking rules are given	440
The period for working each coupe is one year from the 1st of April	442
Details regarding felling and logging, dressing, classification and numbering of logs, and dragging to road side and central depots are given	443 to 457
A tabular statement showing the area to be taken for selection felling annually is given for the period of the plan	458
The areas to be taken up during the succeeding five years in case there is delay in revision are given	459
Regulation of regeneration operations.—The reasons for resorting to artificial regeneration are stated. The gaps to be regenerated will be selected. The felling slash and weed growth will be cleared, collected in heaps and burnt. The gaps will be staked at an espacement of 6 feet by 6 feet (1.83 metres by 1.83 metres) by the end of April	460 to 469
One year old stumps of teak, rosewood and *Vengai* will be planted with the onset of the pre-monsoon showers during the latter half of May	470
Nursery.—Nurseries will be raised for raising stumps of teak, rosewood and *Vengai*.	471

Paragraphs.

Subsidiary silvicultural operations.—Details regarding the tending operations to be done during the first and second years of planting are given ... ... 472 to 480

Other regulations.—The regenerated coupes will be closed to grazing for a period of five years including the years of regeneration 481

The coupe boundaries will be kept clear annually by lines 10 feet (3.05 metres) wide 482

Coupe numbers, years of felling and regeneration, etc., will be indicated on stone slabs planted in the salient corners of the coupe 483

Control.—The control records to be maintained for the working circle are indicated. 484

CHAPTER IV—THE FUEL WORKING CIRCLE.

General constitution of the working circle.—The Fuel Working Circle includes all the areas allocated to the Fuel Working Circle and the Fuel Plantation Working Circle in the previous plans excepting certain areas which have been excluded due to paucity of growth ... ... 485 to 487

Area.—The area of this working circle is 11,681 acres (4,727.18 hectares) 488

Division of the area.—Eight felling series have been constituted. Details of the felling series are furnished ... ... 491 to 495

Silvicultural system.—The silvicultural system adopted will be the 'Simple Coppice' system. In addition, trees of minor forest produce yielding species of which a list is given will not be felled, as they shall be treated as 'Reserved' species 497

Artificial regeneration in the felled coupes will be done in areas wherever suitable. 498

Choice of species.—The species used in regenerating these forests will be teak, *vengai*, *vagai*, *velvagai*, *karuvagai*, tamarind, neem and *parambai* 499

Rotation.—The rotation is fixed at 30 years for the Chavadi, Mangalapalayam, Poondi and Narasapuram series. For the Thenkaradu and Iruttupallam series, a rotation of 40 years will be adopted as the forests included in these series consist of an admixture of timber yielding species ... ... 500 and 501

Regulation of the yield.—The yield is regulated by area 502

Method of executing fellings.—The annual coupe will be demarcated in accordance with the felling series map by cut lines 6 feet (1.83 metres) wide 503

Trees on the outer periphery of the forest adjoining the coupe will be ring marked and serially numbered to serve as a mark of demarcation 504

Each coupe will be divided into strips ... ... 505 and 506

The cut materials obtained while demarcating the coupe and strip lines will be sold in auction 507

The coupes will be sold annually through the agency of contractors 509

The *voidah* for working will depend on the area of the coupe and shall commence from the 1st of April 510

Coupe arrears if any at the end of the *voidah* will be sold separately 511

All growth in the coupe will be felled except the reserves enlisted 512

The felling rules are given 513

The contractor will be bound to supply fuel in headloads and small timber for agricultural purposes from the coupe to all ryots at rates to be fixed by the District Forest Officer in consultation with the Collector 514

	Paragraphs.
The contractor will be also bound to supply thorns and twigs in headloads to members of the Jaggery Co-operative Societies at rates to be fixed by the District Forest Officer in consultation with the Collector	515
A detailed statement of the areas to be felled during the ten years of the plan is given	516
The areas to be taken up during the succeeding five years in case there is delay in revision, are given	517
Regulation of regeneration operations.—The necessity for artificial regeneration of felled fuel coupes is explained	518
The planting technique to be adopted will be 'the saucer method' for flat country, and 'the trench and mound' method for sloping country. The espacement will be 16½ feet by 16½ feet (5.03 metres by 5.03 metres) for both the techniques. The details regarding the preparation of the planting site are given	519 and 520
Planting will be done during the first showers of the south-west monsoon received during the first week of June	521
One-two years old pot plants of neem, tamarind, *albizzia* species, *parambai* and one year old stumps of teak and *vengai* shall be planted in the centre of the saucer or the centre of the mound (in the trench and mound technique) as the case may be	522 to 524
Nursery.—Pot plants of neem, *vagai*, *karuvagai*, *velvagai* and *parambai* will be raised. The details of nursery technique are given	525 to 527
One year old stumps of teak and *vengai* will be obtained by raising nurseries	528
Subsidiary silvicultural operations.—Details regarding the tending operations to be done during the first two years are given	529 to 538
Other regulations.—The coupes will be demarcated by stone slabs erected at the corners of each coupe	539
Plantation boards will be indicated for each plantation showing particulars of the area regenerated. The regeneration areas will be fenced until the third year of planting.	540 and 541
The felled coupes will be closed to grazing for a period of six years, including the year of exploitation	542
Closure of areas burnt is prescribed	544
Control.—The control records to be maintained for the working circle are indicated	547 to 550

CHAPTER V—THE BAMBOO WORKING CIRCLE.

General constitution.—The working circle includes all areas in the Walayar and Bolampatti Valleys where bamboos occur in workable quantities	551 to 553
Area.—The total gross area of the working circle is 36,458 acres (14,754.19 hectares). The net bamboo bearing area is 28,990 acres (11,731.96 hectares)	554
Division of the area.—The details of the three felling series constituted are furnished	557 to 559
System of management.—The Silvicultural system adopted will be the culm selection system	564
Felling cycle.—A felling cycle of three years is adopted.	565
Regulation of the yield.—The yield will be regulated by area	566
Method of executing fellings.—The coupes will be exploited through the agency of contractors	567

	Paragraphs
The period of contract will be one year starting from the 1st of April	568
The felling rules are laid down	569 and 570
The contractor will be bound to supply bamboos to ryots and Basket-makers' Co-operative Societies, bamboos for their bonafide use at rates fixed by the District Forest Officer in consultation with the Collector	571 and 572
Details regarding the coupes are furnished in a tabular statement indicating the years of working	573 to 575
Other regulations.—The forests included in this working circle will be open to grazing at all times	576
Control.—The control records to be maintained are indicated	578 to 582

CHAPTER VI—THE MINOR FOREST PRODUCE WORKING CIRCLE.

General constitution of the working circle.—This working circle will include all the reserved forests of Bolampatti Range, and for the purpose of the sale of *avaram* bark only, the unreserves and road margins also	583
Analysis and valuation of the crop.—The chief items of minor forest produce are indicated	584
Division of the area.—The range is divided into farms. Wherever any produce is abundant, e.g., tamarind they will be put for sale separately. The units of sale are given	586
Method of exploitation.—All minor forest produce except deer and sambhur horns, valuable remains of dead animals, stone and gravel will be exploited through the agency of contractors	587
Deer and sambhur horns and the valuable remains of dead animals will be collected departmentally	588
Stone and gravel will be leased out at seigniorage rates to the desirous public from the existing quarries. The seigniorage rates are given	589
The annual lease will commence from 1st July for all the units except *avaram bark* for which the lease period will commence from 1st April and for Tamarind for which the *voidah* will commence from 1st January	591 to 593
Subsidiary silvicultural operations.—Planting of two year old pot plants of tamarind on either side of cart-tracks and roads passing through the forest at the rate of 20 plants per beat per year is prescribed. The plants will be put in 1 foot (.31 metre) deep pits with 3 feet (.91 metre) saucers at an espacement of 40 feet (12 metres approximately)	595 to 598
Control.—The control records to be maintained are indicated	599 and 600

CHAPTER VII—THE GRAZING WORKING CIRCLE.

General constitution of the working circle.—The working circle covers the entire range except the areas specifically closed to grazing	601
Closure to grazing.—Details of the areas closed to grazing are given	602 to 606
Method of treatment.—Grazing will be regulated by the issue of permits	607

Paragraphs.

The grazing year will be the entire fasli year starting from the 1st of July and extending to the following 30th of June. The whole range will be the grazing unit 609

The grazing fees will be collected departmentally 610

Fodder grass.—Fodder grass removal by ryots and co-operative milk supply unions will be permitted in the reserved forests in accordance with the orders of the Government from time to time 611

Conditions regulating the removal of grass are given 611

Other Regulations.—A grazing notification will be published annually in the Gazette specifying the areas closed to grazing and the conditions regulating the grazing 612

Areas closed to grazing will be indicated by red sign boards 613

The Irulars and Muduvars residing inside the forests will be allowed to graze their cattle free subject to a limit specified by the District Forest Officer for each settlement ... 614

Penning.—Licences for penning cattle at approved pens will be issued at prescribed rates 615

A list of existing cattle pens in the range is tabulated 616

Control.—The control records to be maintained are indicated ... ... 617 and 618

CHAPTER VIII—MISCELLANEOUS REGULATIONS.

A. *Softwood plantations.*—The total area of softwood plantations in the range is 1,502.70 acres (608.12 hectares) 620

The existing softwood plantations will be managed. All the softwood plantations are constituted into one series, the Bolampatti Softwood Plantation Series ... ... 621 and 622

The weeding and tending operations to be done for the first two years of the plantation are indicated 625

Measures against defoliator and stem-borer attack are indicated 626

All plantations will be closed to grazing for a period of five years including the year of regeneration 626

The boundaries of the plantation will be cleared annually to serve as a fire protection measure 626

Plantation boards indicating the particulars of each plantation shall be provided ... 626

Inspection paths will be laid out for each plantation 626

The control records to be maintained are indicated 627

B. *Planting of degraded areas.*—A list of degraded areas is given. Regeneration with *Manjakonnai* (*Cassia siamea*) on a small scale of 5 acres (2.02 hectares) annually per beat instead of the traditional fuel species is prescribed as the latter have failed in the past ... ... 628 and 629

The technique adopted will be the 'trench and mound' method. Trenches 6 feet by 1 foot by 1 foot (1.83 metres by .91 metre by .91metre) will be dug along the contour at an espacement of 22 feet (6.71 metres) from centre to centre. The lines will be spaced 22 feet (6.71 metres) apart and the trenches of the alternate planting lines dug in a staggering fashion 630

	Paragraphs.
Two seeds of *Manjakonnai* (*Cassia siamea*) will be sown on each mound at the onset of the north-east monsoon	631
The weeding and tending operations to be done during the first two years are laid down	632 and 633
The regeneration areas will be fenced and closed to grazing **for a period of five years** including the year of planting	634
Plantation journals will be maintained for each regeneration area	635
C. *Sandal propagation centres.*—Propagation of sandal will be done by raising small sandal propagation centres. The areas selected for this purpose are indicated	636 to 640
Clearings 10 feet by 10 feet (3.05 metres by 3.05 metres) at the rate of two per beat will be made annually and sandal and *Dhal* (*Cajanus indica*) seeds sown. The latter is expected to serve as a host. The plants will be kept weeded and watered regularly. Soil working will be done periodically. The results of working will be recorded in the propagation centre journals that will be maintained	642 and 644
Instructions regarding the collection and storage of sandal seeds are detailed	645 and 646
D. *Boundaries.*—The existing practice of clearing and maintenance of the outer boundaries of the reserved forests by the concerned beat subordinates will be continued.	647
Clearance of the top boundaries of Bolampatti Blocks II and III delimiting the forests of the range with that of Kerala State need not be done	648
Suggestions to rectify the discrepancies noted along the outer boundaries of some of the reserves are made	650
Suggestions to define prescribing the limits within which certain rights could be exercised round admitted temples and shrines are also made	651
E. *Fire Protection.*—The details of fire tracing measures to be done are indicated.	652
One fire patrol will be employed per beat for three or four months during the dry season	655
Closure of fire burnt areas to grazing is prescribed	656 and 657
Fire-fighting measures to be adopted in cases of accidental fires are given	658
The control records to be maintained are indicated	660
F. *Roads.*—The existing roads, cart-tracks and bridle-paths will be maintained ...	661
Extension of the Sengalpallam Road to the Waterfall Block is suggested	662
Substantial improvements to the Adivaram-Muthikulam Saddle Road are suggested	663
Acquisition of the cart-track connecting the Irruttupallam-Chinnar road with the Kalkothipathy 1944 teak plantation and effecting improvements to it are suggested.	664
Widening and improvement of the Adivaram-Poondi cart-track to form a *pukka* road is prescribed	665
Formation of cart-tracks from the selection felling coupes to the main feeder roads wherever necessary is also suggested	666
G. *Buildings.*—All departmental buildings will be left in good repair	667
Construction of quarters for the subordinate staff wherever necessary is prescribed.	668 to 676
Construction of rest houses at Navakkarai and Narasapuram are suggested	677 and 678
Suggestions to take over the Mylon's Bungalow from the Coimbatore Municipality are made	679

	Paragraphs.
Suggestions to electrify the Iruttupallam Range Colony are made	680
Suggestions to provide water-supply to the Iruttupallam Forest Colony are made.	681
Suggestions are made to provide sanitary arrangements to all the existing subordinates quarters	682
H. *Rain-guages.*—The existing rain-guages will be maintained	683
Reconstruction of the rain-guage at Sengalpallam is suggested	684
Proper maintenance of rainfall statistics is stressed	685
I. *Timber Transit Rules.*—Suggestions to enforce the General Timber Transit Rules of the State over the range are made	686
Revival of the *tanahs* at Navakkarai and Thombilipalayam is suggested with a view to check the forest produce coming along the Palghat–Coimbatore and Siruvani–Coimbatore roads respectively	687 and 688
J. *Tapal arrangements.*—It is suggested that the District Forest Officer addresses the postal authorities to instal a sub-post office at Alandurai to expedite delivery of postal articles to the Range Office	689
K. *Control.*—Details regarding the maintenance of control forms, record of works and the control journal are given	690 to 698
L. *Plantation and Nursery Journals.*—Details regarding the plantation and nursery journals to be maintained for each regeneration area are given	699 to 704

CHAPTER IX—ESTABLISHMENT AND LABOUR.

Establishment.—The existing scale of territorial staff is quite adequate and no change is therefore advocated	705 and 706
Since it is not proposed to do any more softwood planting within the range, of the special staff of one Forester and five Forest Guards now utilised for this work, only one Forest Guard will be retained for the maintenance of the plantations already raised. Of the others, one Forester and two Forest Guards will be utilised in the works prescribed under the Teak Conversion Working Circle. The excess of two Forest Guards will be retrenched	707
Suggestions to provide a Bungalow Watcher to the Iruttupallam Forest Rest House are made	708
If the proposals to instal tanahs at Navakkarai and Thombilipalayam are implemented, two watchers will be necessary for working as tanahdars	709
Labour.—No difficulty is experienced for recruiting labour for any of the works prescribed in the working plan	710
Suggestions to prefer hill-tribes over the local villagers in the allotment of lands for *ponam* cultivation in the regeneration areas are made	711

APPENDIX I.

STATEMENT SHOWING THE YEARLY RAINFALL IN CENTIMETRES RECORDED AT SOME OF THE IMPORTANT STATIONS IN THE BOLAMPATTI RANGE.

Name of the station.	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1 Metereological Station, Coimbatore.	54·86	43·79	30·91	82·20	71·98	46·08	63·30	90·48	56·18	77·38
2 Madukkarai Associated Cement Factory.	58·25	63·27	45·05	101·76	67·63	59·36	55·26	81·90	69·61	105·12
3 Adivaram Station (maintained by Coimbatore Municipality).	..	..	..	..	..	200·33	176·83	236·27	213·16	309·19
4 Iruttupallam	*	*	50·04	68·07	62·59	62·23	69·60	134·62	80·59	98·09
5 Vellapathy	*	*	95·71	†	†	†	†	†	†	†
6 Sengalpallam	98·30	151·13	96·77	141·22	104·14	109·73	182·34	†	†	†

NOTE.—The rain-guage at Adivaram was installed only during 1955.

* Represents years during which the rainfall figures were not recorded.

† Represents years during which the rainfall figures could not be recorded as the rain-guage was broken.

APPENDIX II.

LIST OF RESERVED FORESTS IN THE BOLAMPATTI RANGE.

The reserved forests in the Bolampatti Range have been notified under the Madras Forest Act as set under ;—

Serial number and name of reserve forest.	Area in acres.	Area in (hectares)	Date of reservation.	Particulars of notification.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)
1. Small Sholakarai (81 acre piece).	81·00	(32·77)	1st July 1889	Section 16, Notification No. 167, dated 17th June 1889, at page 417 of the *Fort St. George Gazette*, dated 25th June 1889.	....
				Amended description in Notification No. 329, dated 27th June 1913, at page 1210 of the *Fort St. George Gazette*, dated 22nd July 1913.	....
2. Bolampatti Block I	14,528·10	(5,879·38)	19th November 1884 ..	Section 16, Notification No. 227, dated 19th November 1884 at pages 780 and 781 of the *Fort St. George Gazette*, dated 2nd December 1884. Amended description in Notification No. 328, dated 27th June 1913 at page 1208 of the *Fort St. George Gazette*, dated 22nd July 1913. Disafforestation of 31·60 acres (12·78 hectares) in Notification No. 330, dated 27th June 1913, at page 1210 of the *Fort St. George Gazette*.	An extent of 2,425·60 acres (1981·61 hectares) was under Panchayat management (*vide* G.O. Ms. No. 1289, Development, dated 3rd August 1936) until 1948 when they were reverted to the Forest Department.
				Disafforestation of 626·80 acres (253·66 hectares) in Notification No. 254, dated 10th September 1923, at page 1049 of the *Fort St. George Gazette*, dated 18th September 1923.	....
				Disafforestation of 16·50 acres (6·68 hectares) in Notification No. 22, dated 9th January 1925 at page 166 of the *Fort St. George Gazette*, dated 20th January 1925.	....
3. Bolampatti Block II	26,318·30	(10,650·95)	19th November 1884 ..	Section 16, Notification No. 227, dated 19th November 1884, at pages 780 and 781 of the *Fort St. George Gazette*, dated 2nd December 1884.	....

APPENDIX II—*cont.*

LIST OF RESERVED FOREST IN THE BOLAMPATTI RANGE—*cont.*

(1)	(2)	(3)	(4)	(5)	(6)
3. Bolampatti Block II—*cont.*				Disafforestation of 28·60 acres (11·57 hectares) in Notification No. 35, dated 7th January 1897, at page 105 of the *Fort St. George Gazette*, dated 19th January 1897.	....
				Disafforestation of 240 acres (97·12 hectares) in Notification No. 468, dated 27th September 1911, at page 966 of the *Fort St. George Gazette*, dated 17th October 1911.	....
				Amended description notified in No. 328, dated 27th June 1913, at page 1209 of the *Fort St. George Gazette*, dated 22nd July 1911.	....
				Disafforestation of 9·2 acres (3·72 hectares) in Notification No. 15, dated 21st December 1921, at page 20 of the *Fort St. George Gazette*, dated 3rd January 1922.	....
4 Bolampatti Block III	7,914·10	(3,202·75)	19th November 1884 ..	Section 16 Notification No. 227, dated 19th November 1884, at pages 780 and 781 of the *Fort St. George Gazette*, dated 2nd December 884.	....
				Disafforestation of 552·90 acres (223·75 hectares) in Notification No. 35, dated 7th January 1897 and Notification No. 30, dated 10th March 1917, at page 105 of the *Fort St. George Gazette*, dated 19th January 1917, at page 105 of the *Fort St. George Gazette*, dated 19th January 1897 and G. O. No. 734, Revenue, dated 10th March 1917 respectively.	....
				Amended description in Notification No. 322 in disafforestation of 2·9 acres (1·17 hectares) in Notification 331 at pages 1209 and 1210 respectively of the *Fort St. George Gazette*, dated 22nd January 1913.	....

APPENDIX III—RIGHTS AND CONCESSIONS.

RIGHTS ADMITTED AND CONCESSIONS GRANTED IN THE BOLAMPATTI RESERVES—BLOCKS I, II AND III FROM THE TIME OF SETTLEMENT UP TO 1921.

I. *Claims to land ordered to be kept as an enclosure within the reserve.*—Thirteen *bullas of land* (*52 acres or* 21·04 *hectares*) have been allotted to the Irulars of Athuparapatti only so long as they work well to the Forest Department in fire-tracing, watching, etc., for hire. They should also reside within the said boundaries '.

Ten *bullas* (40 acres or 161·19 hectares) of land have been granted to the Irulars of Poranipatti on the same conditions as mentioned above.

The claim to Government *patta* rights over field Nos. 44, 45, 46 and 47 of Melagirigoundanpalayam village is admitted; these fields will be excluded from the reserve. Right of way to the same is given by the path which passes north-east and south-west along the reserve boundary.

The claim to Government *patta* rights over field Nos. 49, 51, 52, 77, 84 and 85 of Melagirigoundanpalayam is admitted and the fields are excluded from the reserve. Right of way to the same is given by the path hitherto in use running north-west and south-east through the reserve boundary.

Claim to Government *patta* rights over field Nos. 53, 54 and 55 of Melagirigoundanpalayam is admitted and the fields are excluded from the reserve. Right of way to the same is given by the path running along the reserve boundary.

2·60 acres (1·05 hectares) of field number 86 of Melagirigoundanpalayam being given to Kanakachella Goundan of the same village as compensation for the same extent of his land, field No. 70 taken up for the reserve. Right of way to the same is given by the path running inside the reserve boundary south-east and north-west.

Ten acres (4·05 hectares) of field number 86 of Melagirigoundanpalayam being given to Ramannan of the same village as compensation for the same extent of his land, field No. 113-E taken up for the reserve. Right of way to the same is granted by the path running alongside the reserve boundaries south-east and north-west.

7·25 acres (2·93 hectares) of field number 86 of Melagirigoundanpalayam being given to Rangaswami Pillai as compensation for the same extent of his land, field No. 113-F taken up for the reserve. Right of way to the same is given by the path going along the reserve boundary.

Two acres (0·81 hectares) of land of field No. 86 of Melagirigoundanpalayam being given to Mulse Sinnan as compensation for the same extent of his land, field No. 113-G. Right of way to the same is given by the path running along the reserve boundary north-west and south-east.

The total extent of this land is about 200 *bullas* (800 acres or 323.75 hectares) on the Coimbatore side of Vellingirimalai, extending westwards to Vellingiri peak, being admitted, the same is excluded from the reserve.

Land has been allotted to the Irulars of Pungamacheripatti free of assessment near Vellapatti between the following boundaries, viz. :—

North.—Noyil river.

South.—Vannanparai hill.

East.—The eastern biundary of No. II reserve block ; and

West.—Sepankuli hill.

The total extent of this land is about 200 *bullas* (800 acres or 323·75 hectares) or more. The extent allotted to this patti is 14 *bullas* (56 acres or 22·66 hectares) at one *bulla* per head free of assessment as long as they work for the Forest Department by residing in the reserve.

Irulars of Porathipatti have agreed to surrender their patta rights and to take land free of assessment near Vellapatti within the boundaries above mentioned, provided service is rendered for hire to the Forest Department in fire-tracing, watching, etc. The extent allotted is 17 bullas (68 acres or 27.52 hectares). They should reside within the said boundaries.

Nine *bullas* (36 acres or 14·51 hectares) of land have been given to the Irulars of Vellapatti on the same condition and at the same place as mentioned above.

Three *bullas* of land have been given to the Irulars of Pettapatti on the same condition as said above.

Fourteen *bullas* (56 acres or 22·66 hectares) have been given to the Irulars of Singampatti on the same condition and at the same place as mentioned in the above claims.

Six *bullas* of land have been granted to the Irulars of Purasampatti on the same condition and at the same place as mentioned above.

II. *Varampoo spring.*—One mile west of Rangaswamy temple, is allowed for the public to bring water for cooking purposes.

III. *Temples and rights of way to go thereto.*—The well of Peria Kinar, situated about 100 chains south of the village of Mukasimangalam and 10 chains south of the reserve limit, which is used by the people of Mukasimangalam and Kalimangalam, is excluded from the reserve as is also the path thereto from the above villages. Sunkanaparai uthu, spring lying due south of field No. 125 of Kalimangalam and ten chains south of the reserve limit, is also excluded from the reserve with path to it. The same holds good with Poliyampathi uthu, the stream from which flows through field No. 151 of Kalimangalam and is situated four chains south of the reserve boundary.

The use of the above spring is restricted to the people of Kalimangalam and Mukasimangalam.

The temple called Rangaswami Koil is excluded from the reserve, from the limit of which it is only forty yards (36·58 metres) distant or thereabouts. This exclusion is made on the understanding that the pujari takes care that no fire used at the temple shall spread to the neighbouring forests. Right of way to the temple is given to all castes as well as *Paraiyas* and *Chucklers* by the present path. Permission is also given to all visitors to the temple to go to and from the temple to the Varampoo spring, one mile west of the temple in order to bring water from thence for cooking. This path lies inside the reserve.

Public right of way to the temple on the summit of Vellimalai is admitted subject to certain restrictions. The right is restricted to caste persons; the time of usage is restricted to the months of March and April each year; the number should be limited to 700 as far as practicable; the path to be used is that which passes the hamlet called Poondi, north of the Noyil river. No cooking of any provisions between the reserve boundary and the top of the hill is permitted. No fire is to be kindled within that space.

Public right of way to Sadaiamman temple on the hill called Kalkothi near the hamlet of Kalkothipathi about 6 furlongs from the reserve boundary, is admitted subject to certain restrictions. Time of usage is restricted to August. Path to be used is the one passing through Kil Vannanparai hamlet. The right is restricted to caste people. Fire may be kindled and offerings cooked at the temple subject to the usual forest regulations, in the month of August only and on Tuesday only in that month.

The claim to the right of way to the temple called Maruthamalai kovil is admitted. The route to be used is the one now used, proceeding east from the temple to the foot of the hill and built with steps in parts. The width of the path is about ten feet.

Fires and cooking are permissible at the chavadi near the temple. The path may be used on any day in the year. Right to the use of the temple well is also given.

The claim of the caste people of Devarayapuram, Parameswarampalayam, Vellarugampalayam, Kuppipalayam and Vellayapalayam and their hamlets to the right of way to the Perumal Koil about a quarter of a mile inside the reserve to the north of these villages and to the right to use the well of the temple for watering their cattle, is admitted subjected to the following restrictions.—

A thousand cattle may be watered daily if sufficient water is available. No fires for cooking or other purposes are kindled at the temple.

IV. *Right of way (General).*—Right of way is given to Colonel Scott and his servants to go and come through the reserve by the path now used for that purpose and cleared by him with the permission of the Local Fund Board. The path enters the reserve from the fields of Narasapuram about one mile and a half north-west of where that name is shown on the taluk map and runs up to the crest of the hill over Varadimalai.

Right of way is given to Lalji Sait to go and come through the reserved forest along the present path up the Porathi Saddle as far as the limits of the district in order to reach his coffee garden on the other side in Malabar district.

Public right of way to the koil called Nallur Perumal on the west bank of the Nandangiripallam near Perasampatti is admitted subject to certain restrictions. Time of usage is restricted to March, April, May and August; and to caste persons. No cooking or kindling fire to be carried on the west bank of Nandangiripallam. Cooking, etc., to be done on the east bank of the above pallam.

The claim to the right of way to Malabar district is admitted to the villagers of Devarayapuram, Parameswarampalayam, Thondamuthur, Vellarangampalayam and Kuppapalayam and to their cattle.

The right will ordinarily be exercised in the months of March, April and May but may be exercised in other months if pasturage is insufficient on this side. About one thousand heads of cattle are permitted to use this path during the year. The cattle are not to remain in the reserve without the permission of the Forest Officer but to go, according to the present custom straight over the hill into the Malabar country in one day; the same condition holds good on their return, since cattle are accustomed to remain in Malabar for weeks together without returning to this side.

V. *Other rights (claims of Irulars and other hillmen, etc.).*

The claim to collect honey and bees-wax in the reserve is admitted for the Irulars of Porathipathi.

The Irulars of Porathipathi are allowed to collect gallnuts for sale to the forest contractor.

The Irulars of Singapathi are allowed to collect soap-nuts for sale to the forest contractor.

Rights admitted and concessions granted in the Reserves—Blocks I, II and III after 1921.

(1) *Poondi temple.*—An area of 9.2 acres (3.72 hectares) consisting of Siva temple, Teppakulam and other places of worship was disafforested in Notification No. 15, dated 21st December 1921.

A public right of way to the temple on the top of Vellimalai is admitted, which passes through the eastern side of Poondi temple enclosure.

As far as the Poondi temple enclosure, right of way is allowed to a width of 30 feet (9.14 metres) and is open to men, cattle and wheeled traffic. Thereafter the right of way is limited to a width of 10 feet (3.05 metres) and is only open to men and cattle.

No fire may be lighted at the Vellimalai temple or anywhere in the reserved forest.

The Taluk Board, Coimbatore is permitted to carry out works for the maintenance of the road within the admitted width as far as the Poondi temple—*Vide* Chief Conservator's Mis. No. 305, dated 4th June 1930.

A slight deviation to straighten a short and steep curve of the road in the right of way was sanctioned by the Chief Conservator of Forests in his No. 947/35 B-3, dated 28th October 1935.

Government in G.O. Ms. No. 1670, Development, dated 29th November 1935, ordered that the right of way admitted in G.O. No. 1280, Revenue, dated 19th November 1884 as modified by G.O. No. 769, Development, dated 5th April 1930, shall be extinguished with effect from the date of publication of the revised description of the right of way in the Coimbatore District Gazette.

2. The Collector of Coimbatore in his R. Dis. No. 8059/35, dated 21st November 1935, has granted licence free of charge to the District Board President, Coimbatore to take water by pipe line from Neeliamman spring through Bolampatti reserve for the use of the village residents of Mathipalayam for domestic use only.

3. The Collector of Coimbatore has granted licence in his R. Dis. No. 5381/35, dated 8th November 1935, to the President, District Board, Coimbatore to take water by pipe line for use of the villagers of Dhaliyur, hamlet of Kalikkinayakanpalayam village, Coimbatore taluk from the Thayathorai spring in the Bolampatti Block III Reserved Forest.

4. The Collector of Coimbatore has granted licence to the Trustee of Poondi temple to put up a pipe line for use of the villagers and pilgrims—*Vide* Collector's R. Dis. No. 27th, dated 8th February 1928. A nominal fee of Re. 1 is charged per year.

APPENDIX IV.—LIST OF PLANTATIONS IN THE BOLAMPATTI RANGE.

(A) STATEMENT SHOWING THE PARTICULARS OF TEAK AND HARDWOOD PLANTATIONS IN THE BOLAMPATTI RANGE.

Serial number	Year of planting.	Total area planted in		Existing area covered by plantations				Failed patches		Blanks	
				Teak		Miscellaneous					
		Acres.	(Hectares).	Acres.	(Hectares).	Acres.	(Hectares).	Acres.	(Hectares).	Acres.	(Hectares).
(1)	(2)	(3)		(4)		(5)		(6)		(7)	
	(a) Vellapathy Series.										
1	1908	2·25	(0·91)	1·75	(0·70)	—	..	0·50	(0·20)	..	..
2	1928	31·25	(12·64)	8·25	(3·34)	12·25	(4·96)	8·00	(3·24)	2·75	(1·11)
3	1929	28·00	(11·33)	3·50	(1·41)	16·50	(6·68)	8·00	(3·24)	..	..
4	1930	28·00	(11·33)	8·60	(3·48)	16·00	(6·48)	3·40	(1·37)	..	..
5	1931	23·50	(9·50)	9·25	(3·74)	7·50	(3·03)	0·50	(0·20)	6·25	(2·53)
6	1932	20·25	(8·19)	8·75	(3·54)	11·50	(4·65)	..	..	..	..
7	1933 (a)	1·92	(0·77)	1·92	(0·77)	..	..	..	..	..	..
8	1933 (b)	25·50	(10·21)	4·50	(1·82)	19·75	(7·99)	1·25	(0·50)	..	..
9	1934	31·00	(12·54)	12·90	(5·22)	16·10	(6·52)	2·00	(0·81)	..	..
10	1935	30·00	(12·14)	11·50	(4·65)	17·00	(6·88)	1·50	(0·60)	..	..
11	1936 (a)	27·50	(11·12)	10·50	(4·25)	8·75	(3·54)	8·25	(3·34)	..	..
12	1936 (b)	8·75	(3·54)	5·75	(2·32)	..	..	3·00	(1·21)	..	..
13	1937 (a)	21·25	(8·59)	8·62	(3·49)	5·75	(2·32)	6·88	(2·78)	..	..
14	1937 (b)	18·75	(7·59)	15·25	(6·17)	2·50	(1·01)	1·00	(0·40)	..	..
15	1938	30·00	(12·14)	14·25	(5·77)	10·75	(4·35)	5·00	(2·02)	..	..
16	1939	10·50	(4·25)	5·50	(2·22)	4·75	(1·92)	0·25	(0·10)	..	..
17	1940	30·50	(12·34)	13·62	(5·51)	13·13	(5·31)	3·75	(1·51)	..	..
18	1941	19·50	(7·89)	5·50	(2·22)	3·60	(1·45)	10·40	(4·21)	..	..
19	1942	22·50	(9·10)	16·50	(6·68)	5·35	(2·18)	0·65	(0·26)	..	..
20	1943	24·00	(9·71)	23·40	(9·46)	0·60	(0·24)	..	..	..	..
21	1944	28·75	(11·73)	25·75	(10·31)	3·00	(1·21)	..	..	..	..
22	1945	28·00	(11·33)	18·75	(7·59)	0·25	(0·10)	8·75	(3·54)	0·25	(0·10)
23	1946	28·00	(11·33)	26·75	(10·82)	..	..	1·25	(0·50)	..	..
24	1957	38·00	(15·38)	38·00	(15·38)	..	..	..	..	..	..
25	1958	50·00	(20·23)	50·00	(20·23)	..	..	..	..	..	..

APPENDIX IV.—LIST OF PLANTATIONS IN THE BOLAMPATTI RANGE—*cont.*

(*A*) STATEMENT SHOWING THE PARTICULARS OF TEAK AND HARDWOOD PLANTATIONS IN THE BOLAMPATTI RANGE—*cont.*

Serial number.	Year of planting	Total area planted in		Existing area covered by plantations.				Failed patche		Blanks.	
				Teak		Miscellaneous					
		Acres.	(Hectares).	Acres.	(Hectares).	Acres.	(Hectares).	Acres.	(Hectares).	Acres.	(Hectares).
(1)	(2)	(3)		(4)		(5)		(6)		(7)	
				(a) Vellapatty Series—cont.							
26	1959	50·00	(20·23)	50·00	(20·23)	..	..	..	..	..	..
27	1960	47·00	(19·02)	30·00	(12·14)	17·00	(4·88)	..	..	..	..
	Total ..	704·67	(285·17)	429·06	(173·63)	192·03	(77·71)	74·33	(29·08)	9·25	(3·74)
				(b) Kalkothipathy Series.							
28	1926 (Experimental plantation).	5·50	(2·22)	5·50	(2·22)	..	..	..	..	..	..
29	1933	2·00	(0·81)	2·00	(0·81)	..	..	..	..	..	..
30	1938	9·00	(3·64)	4·50	(1·82)	..	..	4·50	(1·82)	..	..
31	1939	14·00	(5·67)	13·90	(5·62)	..	..	..	..	0·10	(0·04)
32	1940	19·25	(7·79)	18·40	(7·45)	..	..	..	..	0·85	(0·34)
33	1941	14·25	(5·77)	5·50	(2·22)	..	..	8·75	(3·54)	..	..
34	1942	15·00	(6·07)	9·00	(3·64)	0·15	(0·34)	4·40	(1·78)	0·75	(0·30)
35	1943	15·60	(6·31)	13·15	(5·32)	0·60	(0·24)	..	..	1·85	(0·74)
35	1944	18·75	(7·59)	17·10	(6·92)	0·90	(0·36)	..	..	0·75	(0·30)
37	1945	15·50	(6·27)	9·50	(3·84)	6·00	(2·43)	..	..	..	..
38	1946	25·50	(10·21)	22·40	(9·06)	3·10	(1·25)	..	..	..	..
	Total ..	154·35	(62·46)	120·95	(48·94)	11·45	(4·62)	17·65	(7·14)	4·30	(1·74)
				(c) Plantations outside the two felling series constituted.							
39	1957 (Sholakarai)	12·00	(4·86)	The entire plantation is a complete failure.							

N.B.—The small extent of areas planted with teak and hardwood species at Sholakarai during the years 1955 and 1956 are not enlisted here as they were expected to form part of the future timber-*cum*-fuel-coupes.

(B) Statement Showing the particulars of Softwood Plantations in the Bolampatti Range.

Serial number and name of the plantation.	*Year of planting.*	*Species planted.*	*Area in Acres.*	*Area in Hectares.*	*Remarks.*
(1)	(2)	(3)	(4)		(5)
1. Kallar bit I	1954	*Ailanthus excelsa* and *Salmalia malabarica* Cashew plants were put as replacement.	23·30	(9·42)	....
2. Kallar bit II	1954	Do.	35·60	(14·40)	....
3. Kallar bit III	1954	Do.	35·10	(14·20)	....
4. Kallar bit IV	1954	Do.	53·20	(21·51)	....
5. Mullangadu	1954	Do.	86·30	(34·92)	....
6. Singapathy bit I	1954	Do.	17·50	(7·08)	....
7. Singapathy bit II	1954	Do.	28·10	(11·37)	....
8. Mangalapalayam bit I	1954	*Ailanthus excelsa* and *Salmalia malabarica* ..	17·15	(6·94)	....
9. Mangalapalayam bit II	1954	Do. ..	33·70	(15·25)	....
		Total ..	296·50	(119·99)	
10. Mullangadu bit I	1955	*Ailanthus excelsa* and *Salmalia malabarica* ..	76·90	(31·06)	....
11. Mullangadu bit II	1955	Do. ..	46·40	(18·69)	....
12. Mullangadu bit III	1955	Do. ..	51·90	(20·99)	....
		Total ..	174·20	(70·50)	
13. Mullangadu	1956	*Ailanthus excelsa* and *Salmalia malabarica*	215·00	(87·00)	....
14. Do.	1957	Do. .. *Eucalyptus* hybrid plants were put along the periphery.	207·00	(83·77)	....
15. Do.	1958	*Ailanthus excelsa* and *Salmalia malabarica* ..	203·00	(82·15)	....
16. Do.	1959	*Salmalia malabarica*	202·00	(81·75)	....
17. Do.	1960	*Salmalia malabarica* (Teak was planted in the quincunx of 12'×12').	205·00	(82·96)	....
		Grand total of all Softwood Plantations ..	1,502·70	(608·12)	

APPENDIX V.—STATEMENT SHOWING THE DETAILS OF QUALITY CLASS STOCK-MAPPING OF TEAK PLANTATIONS IN THE BOLAMPATTI RANGE.

Serial number.	Year of planting.	Extent of area stocked with teak		Areas that fall under the different All-India site quality classes.									
				I		II		III		IV		Below IV	
		Acres.	(Hectares.)	Acres.	(Hectares.)	Acres.	(Hectares.)	Acres.	(Hectares.)	Acres.	(Hectares.)	Acres.	(Hectares.)
(1)	(2)	(3)		(4)		(5)		(6)		(7)		(8)	
				(a) Vellapathy Series.									
1	1908	1·75	(0·70)	..	..	..	..	1·60	(0·64)	0·15	(0·06)	..	..
2	1928	8·25	(3·34)	..	..	2·25	(0·91)	6·00	(2·43)	..	..	..	..
3	1929	3·50	(1·41)	..	..	1·00	(0·40)	2·50	(1·11)	..	..	..	..
4	1930	8·60	(3·48)	..	..	1·60	(0·64)	7·00	(2·83)	..	..	..	..
5	1931	9·25	(3·74)	..	..	0·88	(0·35)	5·87	(2·37)	2·50	(1·11)	..	..
6	1932	8·75	(3·54)	..	..	0·75	(3·30)	8·00	(3·24)	..	..	..	..
7	1933 (a)	1·92	(0·77)	..	..	..	..	1·92	(0·77)	..	..	..	..
8	1933 (b)	4·50	(1·82)	..	..	..	..	0·85	(0·34)	3·65	(1·47)	..	..
9	1934	12·90	(5·22)	..	..	..	..	6·65	(2·69)	6·25	(6·53)	..	..
10	1935	11·50	(4·65)	..	..	..	..	1·15	(0·46)	10·35	(4·19)	..	..
11	1936 (a)	10·50	(4·25)	..	..	..	..	5·00	(2·02)	5·12	(2·07)	0·38	(0·15)
12	1936 (b)	5·75	(2·32)	..	..	..	..	3·75	(1·51)	2·00	(0·81)	..	..
13	1937 (a)	8·62	(3·49)	..	..	..	..	4·00	(1·62)	4·62	(1·87)	..	..
14	1937 (b)	15·25	(6·17)	..	..	3·00	(1·21)	12·25	(4·96)	..	..	..	..
15	1938	14·25	(5·77)	..	..	4·25	(1·72)	10·00	(4·05)	..	..	..	..
16	1939	5·50	(2·22)	..	..	1·30	(0·52)	4·20	(1·70)	..	..	..	..
17	1940	13·62	(5·51)	..	..	..	..	6·90	(2·79)	6·72	(2·72)	..	..
18	1941	5·50	(2·22)	..	..	..	..	2·30	(0·93)	3·20	(1·29)	..	..
19	1942	16·50	(6·68)	..	..	..	..	8·50	(3·44)	8·00	(3·24)	..	..
20	1943	23·40	(9·46)	..	..	0·15	(0·60)	15·90	(6·43)	7·35	(2·97)	..	..
21	1944	25·75	(10·31)	..	..	..	..	4·55	(1·84)	21·20	(8·57)	..	..
22	1945	18·75	(7·59)	..	..	..	..	2·50	(1·11)	16·25	(6·58)	..	..
23	1946	26·75	(10·82)	..	..	12·50	(5·06)	11·50	(4·65)	2·75	(1·21)	..	..
	Total..	261·06	(105·64)	..	..	27·68	(11·19)	132·89	(53·78)	100·11	(40·51)	0·38	(0·15)

APPENDIX V.—STATEMENT SHOWING THE DETAILS OF QUALITY CLASS STOCK-MAPPING OF TEAK PLANTATIONS IN THE BOLAMPATTI RANGE—*cont.*

Serial number.	Year of planting.	Extent of area stocked with teak		Areas that fall under the different All-India site quality classes. I		II		III		IV		Below IV.	
		Acres.	(Hectares.)	Acres.	(Hectares.)	Acres.	(Hectares.)	Acres.	(Hectares.)	Acres.	(Hectares.)	Acres.	(Hectares.)
(1)	(2)	(3)		(4)		(5)		(6)		(7)		(8)	
	(b) Kalkothipathy Series.												
24	1926 ..	5·50	(2·22)	..	..	..	..	3·75	(1·51)	1·75	(0·70)	..	..
25	1933 ..	2·00	(0·81)	..	..	..	..	2·00	(0·81)	..	..	..	..
26	1938 ..	4·50	(1·82)	..	..	..	..	4·35	(1·76)	0·15	(0·06)	..	..
27	1939 ..	13·90	(5·62)	..	..	..	..	12·55	(5·08)	1·35	(0·54)	..	..
28	1940 ..	18·40	(7·45)	..	..	..	..	17·90	(7·24)	0·50	(0·20)	..	..
29	1941 ..	5·50	(2·22)	..	..	..	..	4·75	(1·92)	0·75	(0·30)	..	..
30	1942 ..	9·00	(3·64)	..	..	..	..	0·15	(0·06)	8·85	(3·58)	..	..
31	1943 ..	13·15	(5·32)	..	..	1·40	(0·56)	11·75	(4·75)	..	..	..	..
32	1944 ..	17·10	(6·92)	..	..	1·40	(0·56)	10·40	(4·21)	5·30	(2·14)	..	..
33	1945 ..	9·50	(3·84)	..	..	1·20	(0·48)	7·80	(3·15)	0·50	(0·20)	..	..
34	1946 ..	22·40	(9·06)	..	..	..	..	14·75	(5·97)	7·65	(3·09)	..	..
	Total ..	120·95	(48·94)	..	..	4·00	(1·62)	90·15	(36·48)	26·80	(10·84)	..	..
	Grand total ..	382·01	(154·59)	..	..	31·68	(12·81)	223·04	(90·26)	126·91	(51·35)	0·38	(0·15)

APPENDIX VI.

TABLE SHOWING TOP HEIGHT AGAINST ALL-INDIA SITE QUALITY AND AGE FOR PLANTATION TEAK.

Site quality.	I			II			III			IV		
	2·0	1·0	0·0	2·0	1·0	0·0	2·0	1·0	0·0	2·0	1·0	0·0
Age in years.	Top height in feet.											
5	42	37	33	33	28	24	24	20	16	16	13	10
6	47	41	37	37	32	27	27	23	19	19	15	11
7	51	45	41	41	35	31	31	26	21	21	16	12
8	55	49	44	38	33	33	33	28	23	23	18	13
9	58	52	47	47	41	36	36	30	25	25	19	14
10	62	56	50	50	44	38	38	32	27	27	21	15
11	65	59	53	53	46	40	40	34	28	28	22	16
12	68	61	55	55	49	42	42	36	30	30	23	17
13	71	64	58	58	51	44	44	38	31	31	24	18
14	74	67	60	60	53	46	46	39	32	32	26	19
15	76	69	62	62	55	48	48	41	34	34	27	19
16	79	71	64	64	57	49	49	42	35	35	28	20
17	81	74	66	66	58	51	51	43	36	36	29	21
18	83	75	68	68	60	52	52	45	37	37	30	22
19	85	77	69	69	71	53	53	46	38	38	30	23
20	87	79	71	71	63	55	55	47	39	39	31	23
21	89	80	72	72	64	56	56	48	40	40	32	24
22	90	82	74	74	65	57	57	49	41	41	33	25
23	92	83	75	75	67	58	58	50	42	42	34	25
24	93	85	76	76	68	60	60	51	43	43	35	26
25	95	86	78	78	69	61	61	52	44	44	35	27
26	96	87	79	79	70	62	62	53	45	45	36	27
27	97	89	80	80	71	63	63	54	45	45	36	27
28	99	90	81	81	72	64	64	55	46	46	37	29
29	100	91	82	82	73	65	65	56	47	47	38	29
30	101	92	83	83	74	65	65	56	47	47	38	29
31	102	93	84	84	75	66	66	57	48	48	39	30
32	103	94	85	85	76	67	67	58	49	49	40	31
33	104	95	86	86	77	68	68	59	50	50	40	31
34	105	96	87	87	78	69	69	60	50	50	41	32
35	106	97	88	88	78	69	69	60	51	51	42	32
36	107	98	89	89	80	70	70	61	52	52	42	33
37	108	99	90	90	80	71	71	62	52	52	43	34
38	109	100	91	91	81	72	72	63	53	53	43	34
39	110	101	92	92	82	73	73	63	53	53	44	35
40	111	102	92	92	83	73	73	64	54	54	45	35

41	..	..	..	..	112	103	93	93	84	74	74	65	55	55	45	36
42	..	..	..	..	113	104	94	94	84	75	75	65	55	55	46	36
43	..	..	..	..	114	104	95	95	85	75	75	66	56	56	46	37
44	..	..	..	..	115	105	96	96	86	76	76	67	57	57	47	38
45	..	..	..	..	116	106	96	96	86	77	77	67	57	57	47	38
46	..	..	..	..	117	107	97	97	87	78	78	68	58	58	48	38
47	..	..	..	..	118	108	98	98	88	78	78	68	58	58	48	39
48	..	..	..	..	118	109	99	99	89	79	79	69	59	59	49	39
49	..	..	..	..	119	109	99	99	89	79	79	69	60	60	40	40
50	..	..	..	..	120	110	100	100	90	80	80	70	60	60	50	40
51	..	..	..	..	121	111	101	101	91	81	81	71	60	60	50	40
52	..	..	..	..	122	111	102	102	91	81	81	71	61	61	51	41
53	..	..	..	..	122	112	102	102	92	82	82	71	61	61	51	41
54	..	..	..	..	123	113	103	103	92	82	82	72	62	62	52	42
55	..	..	..	..	124	114	104	104	93	83	83	73	62	62	52	42
56	..	..	..	..	124	114	104	104	93	83	83	73	63	63	53	42
57	..	..	..	..	125	115	105	105	94	84	84	74	63	63	53	43
58	..	..	..	..	126	115	105	105	95	84	84	74	64	64	54	43
59	..	..	..	..	126	116	106	106	95	85	85	75	64	64	54	44
60	..	..	..	..	127	117	106	106	96	85	85	75	65	65	54	44
61	..	..	..	..	128	117	107	107	96	86	86	76	65	65	55	44
62	..	..	..	..	128	118	108	108	97	87	87	76	66	66	55	45
63	..	..	..	..	129	119	108	108	98	87	87	77	66	66	56	45
64	..	..	..	..	130	120	109	109	98	88	88	77	66	66	56	45
65	..	..	..	..	130	120	109	109	99	88	88	78	67	67	56	46
66	..	..	..	..	131	120	110	110	99	89	89	78	67	67	57	46
67	..	..	..	..	132	121	110	110	100	89	89	79	68	68	57	46
68	..	..	..	..	132	122	111	111	100	90	90	79	68	68	57	46
69	..	..	..	..	133	122	112	112	101	90	90	79	69	69	58	47
70	..	..	..	..	134	123	112	112	101	91	91	80	69	69	58	47
71	..	..	..	..	134	124	113	113	102	91	91	80	69	69	59	48
72	..	..	..	..	135	124	113	113	102	92	92	81	70	70	59	48
73	..	..	..	..	136	125	114	114	103	92	92	81	70	70	59	48
74	..	..	..	..	136	125	115	115	103	93	93	82	71	71	60	49
75	..	..	..	..	137	126	115	115	104	93	93	82	71	71	60	49
76	..	..	..	..	138	127	116	116	104	94	94	82	71	71	60	49
77	..	..	..	..	138	127	116	116	105	94	94	83	72	72	61	49
78	..	..	..	..	139	128	117	117	105	94	94	83	72	72	61	50
79	..	..	..	..	140	128	117	117	106	95	95	84	72	72	61	50
80	..	..	..	..	140	129	118	118	106	95	95	84	73	73	61	50
81	..	..	..	..	141	130	118	118	107	96	96	84	73	73	82	50
82	..	..	..	..	141	130	119	119	107	96	96	85	73	73	62	51
83	..	..	..	..	142	131	119	119	108	97	97	85	74	74	62	51

APPENDIX VI—*cont.*

TABLE SHOWING TOP HEIGHT AGAINST ALL-INDIA SITE QUALITY AND AGE FOR PLANTATION TEAK—*cont.*

Site quality.	I			II			III			IV		
Age in years.	2·0	1·0	0·0	2·0	1·0	0·0	2·0	1.0	0.0	2·0	1·0	0·0
	Top height in feet.											
84	143	131	120	120	108	97	97	85	75	74	62	51
85	143	132	120	120	109	97	97	86	74	74	63	51
86	144	132	121	121	100	98	98	86	75	75	63	52
87	144	133	121	121	109	98	98	86	75	75	63	52
88	145	134	122	122	110	98	98	87	75	75	63	52
89	146	134	122	122	111	99	99	87	75	75	64	52
90	146	135	123	123	111	99	99	87	76	76	64	52
91	147	135	123	123	111	100	100	88	76	76	64	52
92	147	136	124	124	112	100	100	88	76	76	64	52
93	148	136	124	124	112	101	101	89	77	77	65	52
94	148	137	125	125	113	101	101	89	77	77	65	53
95	149	137	125	125	113	101	101	89	77	77	65	53
96	150	138	126	126	113	101	101	90	77	77	65	53
97	150	138	126	126	114	102	102	90	78	78	65	54
98	151	139	127	127	114	102	102	90	78	78	66	54
99	151	139	127	127	115	103	103	90	78	78	66	54
100	152	140	127	127	115	103	103	91	78	78	66	54

APPENDIX VII—LIST OF MAPS PREPARED FOR THIS WORKING PLAN.

A. Detailed management maps 4″=1 mile (1 cm. = 0·1584 kilometres).

1. Sheet No. 1.
2. Sheet No. 2.
3. Sheet No. 3.
4. Sheet No. 5.
5. Sheet No. 6.
6. Sheet No. 7.

B. Stock maps of Fuel Working Circle showing probable yield in tonnage classes 4″=1 mile (1 cm.=0·1584 kilometres).

7. Sheet No. 2.
8. Sheet No. 3.
9. Sheet No. 5.
10. Sheet No. 6.
11. Sheet No. 7.

C. Teak quality class maps 16 inches = 1 mile (1 cm.=0·0396 kilometres).

12. Key No. 1.
13. Key No. 2.
14. Key No. 3.

D. Key map of Bolampatti Range 1 inch=1 mile (1 cm.=0·631 kilometres).

15. Key map of Bolampatti Range.

APPENDIX VIII—CONTROL FORMS.

CONTROL BOOK.

(Common to all working circles excepting minor Forest Produce and Grazing Working Circles).

Prescriptions of the working plan.					Operations carried out.						Details of yield.					Remarks.
Year.	Name of felling series.	Coupe number.	Area in acres and hectares.	System of felling.	Year.	Name of felling series.	Coupe number.	Surveyed area of coupe.	Area of coupe actually worked.	Nature of fellings.	Description of out-turn.	Average out-turn per acre.	Total out-turn of coupe.	Revenue realised per acre or hectare.	Gross revenue realised.	Particulars regarding reserve trees retained in the coupe (if any).
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)

(Control book for the minor Forest Produce Working Circle).

Prescriptions of the working plan.					Operations carried out.					Details of yield.		
Year.	Name of produce.	Unit of lease.	Period of lease.	Method of working.	Year.	Name of produce.	Unit of lease.	Period of lease.	Method of working.	Yield obtained.	Gross revenue realised.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

(Control Book for the Grazing Working Circle).

Prescriptions of the working plan.				Operations carried out.								
Year.	Area opened to grazing.	Name and area of localities closed to grazing.	Details of penning.	Year.	Area opened to grazing.	Name and area of localities closed to grazing.	Number and description of cattle grazed.	Revenue realised.	Grazing incidence per cow unit.	Name of pen.	Number of cattle licensed to pen.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

Register of Deviations (Common to all working Circles).

Year.	Working circle.	Prescriptions.	Nature of deviation.	Reasons for deviation.	Remarks on any possible action to remedy the deviation.	Number and date of order sanctioning the deviation.
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Record of Works (Common to all Working Circles, except Grazing Working Circle).

Prescriptions of the Working Plan.				Record of operations carried out.					
Year.	Coupe number.	Area in acres (hectares).	Works prescribed.	Year.	Coupe number.	Area in acres (hectares).	Works done.	Cost.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

Control Journal for the Teak Conversion Working Circle.

A. *Growing stock—*

(1) Notes on the distribution of various species in the annual coupe.

B. *Factors influencing the crop : Notes on—*

(i) Climate,
(ii) Animals,
(iii) Insects,
(iv) Fungi,
(v) Fire,
(vi) Man,
(vii) Weeds and climbers.

C. *Exploitation—*

(i) Notes on the suitability of the present division into felling series.
(ii) Notes on the suitability of the method of working prescribed.
(iii) Notes on contractors, and on the labour supply.
(iv) Statement of prices realised per acre for each of the felling series, and comments.
(v) Full account of deviations from the working plan, if any, with detailed justification.

D. *Regeneration*—

(i) Detailed comments on the success or failure of the artificial regeneration measures prescribed with reasons.

(ii) Suggestions for improvement or modifications of technique.

(iii) Notes on the relative success attained with each of the secondary species, viz., *Terminalia tomentosa*, *Dalbergia latifolia* and *Pterocarpus marsupium* in areas unsuitable for teak.

(iv) Notes on the relative merits of *ponam* cultivation or otherwise with relative merits of the different *ponam* crops.

(v) Nursery practice: Observations on the germinative power and pre-treatment of seeds.

(vi) Notes on the weedings and clearings proposed, and suggestions to modify them.

(vii) Notes on the thinnings prescribed and how they work. Applicability of the All-India tables, etc.

(viii) Notes on conversion and sale of thinned produce.

E. *Markets*—

(i) Statements of the prices obtained per unit for each of the clearfelling coupes.

(ii) Prices of firewood, small timber and poles in various markets.

F. *Summary of Revenue and Expenditure*—

A summary of annual revenue and expenditure in such a form as will facilitate comparison with the financial forecast in the working plan.

CONTROL JOURNAL FOR THE SELECTION WORKING CIRCLE.

A. *Growing Stock*—

(i) Notes on the distribution of various species in the annual coupe.

(ii) Notes on the relative value of the various timber species extracted.

B. *Factors influencing the crop*: Notes on—

(i) Climate,

(ii) Animals,

(iii) Insects,

(iv) Fungi,

(v) Fire,

(vi) Man,

(vii) Weeds and climbers.

C. *Exploitation*—

(i) Notes on the suitability of the present division into felling series.

(ii) Notes on the suitability of the method of working prescribed.

(iii) Notes on contractors, and labour supply.

(iv) Statement by girth classes and by species of the estimated yield at the time of marking and the yield obtained from each felling series, with comments on the varying losses in conversion.

C. *Exploitation*—cont.

(v) Statement showing cost of exploitation under—

(*a*) felling charges per unit;

(*b*) conversion charges per unit;

(*c*) dragging charges per unit with average distance; and

(*d*) cost of transport per unit from road-head to central depot with distance.

(vi) Deviations, if any, from working plan prescriptions with detailed justification.

D. *Measures of improvement*—

(i) Results of tending operations prescribed with costs.

(ii) Suggestions for improvement of communications and export routes.

E. *Regeneration*—

(i) *Natural regeneration.*—Observations on the extent of natural regeneration of the more valuable species, in—

(*a*) gaps caused by felling; and

(*b*) unfelled portions of the coupe.

(ii) *Artificial regeneration.*—Observations on—

(*a*) the number of gaps attempted to be regenerated artificially;

(*b*) the number of gaps successfully regenerated;

(*c*) species adopted;

(*d*) relative success obtained with particulars of species or mixture of species; and

(*e*) subsidiary silvicultural operations and the need to modify them.

(iii) *Nursery practice.*—Observations on—

(*a*) the flowering and seeding of the more valuable timber species in various localities in the range;

(*b*) the germinative capacity and plant per cent of the various species; and

(*c*) pre-treatment of seed.

F. *Markets*—

(i) Statement of the prevailing market price per unit for each of the species (classwise).

(ii) Statement by species showing the number of trees marked and the numbers converted with the net yield and the gross revenue obtained.

(iii) Comments on the state of the timber market in general and on fluctuations in prices with probable reasons.

G. *Summary of Revenue and Expenditure*—

A summary of annual revenue and expenditure in such a form as will facilitate comparison with the financial forecast in the working plan.

Control Journal for the Fuel Working Circle.

A. *Growing stock.*—Notes on the growing stock, the relative fuel value of various species, distribution in the several felling series, etc.

B. *Factors influencing the crop*—

(i) Notes on various forms of climatic or natural damage to the crop.

(ii) Illicit fellings and other forest offences, and suggestions for preventing them.

(iii) Incidence of fire and comments on the necessity for or adequacy of the fire protection measures prescribed.

(iv) Notes on the extent to which climbers choke coppice growth and on the need, if any, for tending measures.

C. *Exploitation*—

(i) Notes on the suitability of the present division into felling series with reference to the requirements of local markets.

(ii) Notes on the adequacy of the output of firewood.

(iii) Notes on the suitability of the rotation and the methods of working prescribed.

(iv) Detailed observations on—

(*a*) the growth of coppice shoots :

(*b*) causes for failure of coppice ; and

(*c*) relative coppicing power of different species.

(v) Notes on contractors and labour supply.

(vi) Statements of prices realised from the several felling series and comments.

(vii) Comments on why any particular series could not be worked in any year.

(viii) Full account of deviations from the working plan, if any, with detailed justification.

D. *Measures of improvement*—

(i) Remarks on the conduct of fire protection operations and their results, with suggestions as to possible modifications in layout.

(ii) Remarks on the degree to which the closure to grazing was enforced.

(iii) Suggestions for the improvement of communications and export routes.

E. *Regeneration*—

(i) *Natural regeneration.*—Observations on the extent of natural regeneration of various species.

(ii) *Seeding*—Observation on the seeding of fuel species, time of seeding, etc.

(iii) *Artificial regeneration.*—Detailed comments on the success or failure of the regeneration measures prescribed with reasons.

(iv) Suggestions for improvement or modifications of technique.

(v) Notes on germinative power and plant per cent of seeds of various species

(vi) Notes on the relative success attained with the various species attempted to be introduced.

F. *Markets*—

(i) Notes on the adequacy of the provision made for catering to various local markets.

(ii) Prices of firewood and small timber in various markets.

G. *Summary of Revenue and Expenditure*—A summary of annual revenue and expenditure in such a form as will facilitate comparison with the financial forecast in the working plan.

CONTROL JOURNAL FOR THE BAMBOO WORKING CIRCLE.

A. *Growing stock.*—Notes on the relative distribution of bamboos.

B. *Factors influencing the crop*—Notes on—

(i) Climate.

(ii) Animals.

(iii) Insects.

(iv) Fungi

(v) Fire.

(vi) Man.

C. *Exploitation*—

(i) Notes on the suitability of the present division into felling series.

(ii) Notes on the suitability of the method of working prescribed.

(iii) Notes on contractors and labour supply.

(iv) Statement of the quantity of bamboos removed classwise.

(v) Statement of prices realised from the several felling series and comments.

(vi) Deviations, if any, from working plan prescriptions with detailed justification.

D. *Measures of improvement*—

(i) Remarks on the conduct of fire protection operations and their results, with suggestions as to possible modifications in layout.

(ii) Suggestions for the improvement of communications and export routes.

E. *Flowering*—Observations on the extent of flowering whether—

(i) Sporadic or

(ii) Gregarious and

(iii) Species affected.

F. *Regeneration*—

Observations on the extent of natural regeneration of bamboos following flowering.

G. *Markets*—

(i) Notes on the adequacy of provision made for catering to various local markets.

(ii) Prices of different classes of bamboos in various markets.

H. *Summary of Revenue and Expenditure*—A summary of annual revenue and expenditure in such a form as will facilitate comparison with the financial forecast in the working plan.

CONTROL JOURNAL FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

A. *Growing stock*—Notes on the different items of minor forest produce available in the range.

B. *Factors influencing the crop*—Notes on—

(i) Climate.

(ii) Animals.

(iii) Insects.

(iv) Fungi.

(v) Fire.

(vi) Man

(vii) Weeds and climbers.

C. *Exploitation*—

(i) Notes on the suitability of the present division into 'farms'.

(ii) Notes on the suitability of methods adopted by contractors in collecting minor forest produce.

(iii) Notes on contractors, and on the labour supply.

(iv) Statement of prices realised per unit and comments.

(v) Particulars of units worked departmentally on account of lack of demand from contractors with result.

(vi) Notes on the existing quarries, quantity of stone removed and revenue realised.

(vii) Full account of deviations from the working plan prescriptions, if any, with full justification.

D. *Methods of improvement*—

(i) Suggestions to improve the exploitation of minor forest produce hitherto untapped, if any.

(ii) Suggestions for the improvement of methods of collection adopted.

(iii) Relative success or otherwise in the introduction of avenue trees or tamarind along forest roads with costs.

E *Markets*—Prices of various minor forest produce in the local markets.

F. *Summary of Revenue and Expenditure*—A summary of annual revenue and expenditure in such a form as will facilitate comparison with the financial forecast in the working plan.

CONTROL JOURNAL FOR THE GRAZING WORKING CIRCLE.

(1) Annual abstract of grazing permits issued by villages. The following headings are suggested :—

(*a*) Year.

(*b*) Name of village.

(*c*) Number and description of permits issued.

(*d*) Number and description of permits issued in the previous year.

(*e*) Reasons for increase or decrease.

(2) Notes on the suitability or otherwise of the agency of collection employed.

(3) Notes on the suitability or otherwise of the grazing year adopted.

(4) Notes on the efficacy of closure of burnt areas (*a*) as a punitive measure, and (*b*) as a silvicultural measure.

(5) List of areas closed to grazing annually on account of fires with notes on the results of half yearly inspections.

(6) Notes on the desirability or otherwise of closure of fuel coupes to grazing.

(7) Notes on the desirability or otherwise of permitting penning.

(8) Statement of revenue and expenditure as laid down in the Madras Forest Code to facilitate comparison with the financial forecast made in the working plan.

APPENDIX IX—LIST OF HERBS, SHRUBS AND TREES COMMONLY FOUND IN THE BOLAMPATTI RANGE.

Botanical name. (1)	*Tamil name.* (2)	
Abrus precatorius	Kundumani	குண்டுமணி.
Abutilon indicum	Thuthi	தூத்தி.
Acacia arabica	Karuvelan	கருவேலான்.
Acacia concinna	Siyakayi	சீயக்காய்.
Acacia ferruginea	Parambai	பரம்பை.
Acacia intsia	Indu	இண்டு.
Acacia latronum	Anaimullu	யானைமுள்ளு.
Acacia leucophloea	Velvelan	வெல்வேலான்.
Acacia planifrons	Kodaivelan	கொடைவேலான்.
Acacia pennata	Vellaiindu	வெள்ளை இண்டு.
Acacia suma	Othalai	ஒதலை.
Acalypha fruticosa	Seeni	சீனி.
Acronychia pedunculata	Vidukanalai	விடுகனலை.
Achyranthes aspera	Nayuruvi	நாயுருவி.
Actinodaphne hookeri	Thali	தாளி.
Adhatoda vasica	Adathodai	ஆடாதோடை.
Adina cordifolia	Manjakadambai	மஞ்சகடம்பை.
Aegera tum conyzoides	..	....
Aegle marmelos	Vilvam	வில்வம்.
Agave americana	Kathalai	கத்தாழை.
Aglaia roxburghiana	Chokla	சொக்லா.
Agrostistachys longifolia	Manikulukki	மணிகுலுக்கி.
Ailanthus excelsa	Peemaram	பீமரம்.
Ailanthus triphysa	Mattipal	மட்டிப்பால்.
Alangium salvifolium	Alingi	அளிஞ்சி.
Albizzia amara	Unjal	ஊஞ்சல்.
Albizzia lebbek	Vagai	வாகை.
Albizzia odoratissima	Karuvagai	கருவாகை.
Albizzia procera	Velvagai	வெள்வாகை
Albizzia chinensis	Pilivagai	பிலிவாகை
Allophyllus cobbe	Perrakudikkai	பேரகுடிக்காய்
Alstonia scholaris	Elalaipalai	எலெலப்பா
Anacardium occidentale	Munthri	முந்திரி.
Anogeissus latifolia	Vellanagai	வெள்ளநாகை.
Anona squamosa	Sitapazham	சீதாப்பழம்.
Antiaris toxicaria	Maravuri	மரவுரி.
Antidesma diandrum	Asaripuli	அசரிபுளி.
Ardisia solanacea	..	....
Arenga wightii	Alampanai	ஆலம்பனை.
Aristolochia roxburghiana	Garuda kodi	கருடக்கொடி.
Artocarpus hirsuta	Ainipila	அயினிபலா.

Botanical name. (1)	Tamil name. (2)	
Artocarpus heterophyllus	Pila	பலா.
Asparagus racemosus	Thanuthukodi	தனுத்துக்கொடி.
Atalantia monophylla	Kattuelmichai	காட்டெலுமிச்சை.
Atylosia trinervia	Kattuthovarai	காட்டுத்துவரை.
Azadirachta indica	Vembu	வேம்பு, வேப்பமரம்.
Barleria species	Kanakambaram	கனகாம்பரம்.
Barringtonia acutangula	Kadappay	கடப்பை.
Bauhinia malabarica	Vellathi	வெள்ளத்தி.
Bauhinia purpurea	Mantharai	மந்தாரை.
Bauhinia racemosa	Athi	அத்தி.
Bauhinia vahlii	Kattumantharai	காட்டு மந்தாரை.
Bischofia javanica	Cholavengai	சோலை வேங்கை.
Boerhaavia diffusa	Sattaranai	சாட்டரணை.
Boucerosia umbellata	Sathurakalli	சதுரக்கள்ளி.
Buchanania lanzan	Saraiparuppu	சாரைப்பருப்பு.
Bridelia retusa	Mulvengai	முள்வேங்கை.
Butea monosperma	Elaiporasu	எலைப்பொரசு.
Butea parviflora	Kottavaraikodi	காட்டவரைக்கொடி.
Butea superba	..	..
Caesalpinea bonduc	Kalichikai	களிச்சிக்காய்.
Caesalpinea mimusoides	Pulinakkakonrai	புளிநாக்ககொண்றை.
Calamus species	Perambu	பெரம்பு.
Callicarpa lanata	Vettilaipattai	வெற்றிலைப்பட்டை.
Calophyllum elatum	Kattupunnai	காட்டுப்புன்னை.
Calophyllum inophyllum	Punnai	புன்னை.
Calycopteris floribunda	Pilani	பிலானி.
Canarium strictum	Karunkungiliam	கருங்குங்கிலியம்.
Canthium dicoccum	Nekkini	நெக்கினி.
Canthium parviflorum	Karai	காரை.
Capparis decidua	..	....
Capparis zeylanica	Athondai	ஆதொண்டை.
Carallia brachiata	Andimiriam	அந்திமிரியம்.
Careya arborea	Kolamavu	கொளமாவு.
Carissa carandas	Kilakkai	கிளாக்காய்.
Caryota urens	Koonthal	கூந்தல்பனை.
Cassia auriculata	Avaram	ஆவாரம்.
Cassia fistula	Konnai	கொண்ணை.
Cassia montana	Malayavaram	மலை ஆவாரம்.
Cassia tora	Thagarai	தகரை.
Cassia siamea	Manjakonnai	மஞ்சக்கொண்ணை.
Chloroxylon swietenia	Porasu	பொரசு.
Chomelia asiatica	Pavattai	பாவட்டை.
Chuckrassia tabularis	Vadivembu	வடிவேம்பு.
Chrysophyllum roxburghii	Kattiluppai	காட்டு இலுப்பை.
Cedrela toona	Santhanavembu	சந்தனவேம்பு.
Cinnamomum zeylanicum	Lavangam	லவங்கம்.
Cinnamomum sulphuratum	..	....
Cipadessa baccifera	Savuttuchedi	சவுட்டுச்செடி.
Cissus quadrangularis	Perandai	பெரண்டை.
Citrullus colocynthis	..	....
Clausena dentata	Kattukaruveppilai	காட்டுகருவேப்பிலை.
Cleistanthus collinus	Oduvan	ஒடுவன்.
Clematis species	Kakkakal	காக்காகால்.
Clerodendron viscosum	Vattakanni	வட்டக்கன்னி.
Clitoria ternatea	Sankapushpam	சங்கபுஷ்பம்.
Cochlospermum religiosum	Kongelevam	கொங்கெளவம்.
Combretum ovalifolium	Odaikodi	ஓடைக்கொடி.
Commiphora berryi	Mulkiluvai	முள்ளுகிளவை.
Commiphora mukul	Pachakilavai	பச்சைகிளுவை.
Cordia dichotoma	Naruvili or Virusham	நருவிலி, விருஷம்.
Crataeva religiosa	Mavalingam	மாவலிங்கம்.
Croton malabaricus	Tavattupolavu	தவட்டுப்பொலவு.
Cryptolepis buchanani	..	....
Cullenia rosayroana	Vedipila	வெடிலா.
Curcuma angustifolia	Kattukuvai	காட்டுக்கூவை.
Curcuma longa	Manjal	மஞ்சள்.
Cycas circinalis	Kodi icham	கொடிஈச்சம்.
Dalbergia latifolia	Itti	ஈட்டி.
Dalbergia paniculata	Porapachalai	பொரப்ச்சாலை.
Dalbergia sissoo	Sissoo	சிச்சு.
Datura metel	Valoomathu	வெள்ளுமத்தி.
Delonix elata	Vadamudukki	வாடமுடுக்கி.
Delonix regia	Mayirkonnai	மயிற்கொன்றை.

Botanical name (1)	*Tamil name.* (2)	
Dendrophthoe falcata	Pulluruvi	புல்லுருவி.
Derris species	Yanaikellikodi	யானைக்கெல்லிகொடி.
Derris scandens	Do.	௸
Desmodium species	....	....
Dichrostachys cinerea	Vedathalan	வெடத்தலான்.
Diospyros montana	....	வக்கனை.
Dioscorea species	....	....
Diospyros melanoxylon	Thumbai	தும்பை.
Dodonoea viscosa	Virali	விராலி.
Dolichandrone atrovirens	Pumpadri	பூம்பாதிரி.
Drypetus elata	Veerai	வீரை.
Drypetus sepiaria	Vellelumbu	வெள்ளெலும்பு.
Drypetus venusta	Do.	௸
Dysoxylum malabaricum	Vellagil	வெள்ளகில்.
Elaeocarpus species	Rudraksham	ருத்ராஷம்.
Elaeodendron glaucum	Kannirmaram	கண்ணீர்மரம்.
Elettaria cardamomum	Elakkai	ஏலக்காய்.
Emblica officinalis	Nelli	நெல்லி.
Entada phaseloides	Cillu	சில்லு.
Erythrina variegata	Murukku	முறுக்கு.
Erythrina suberosa	Mulmurukku	முள்முறுக்கு.
Erythroxylon monogynum	Sembulichan	செம்புளிச்சான்.
Eucalyptus hybrid	Nilagirimaram	நீலகிரிமரம்.
Euonymus indicus	....	....
Eupatorium species	....	....
Euphorbia antiquorum	Kalli	கள்ளி.
Euphorbia hirta	....	....
Euphoria longana	Shempuvan	செம்பூவன்.
Evodia lunu-ankenda	Kattushanbagam	காட்டுசன்பகம்.
Fagaria budrunga	Kattumurukku	காட்டுமுறுக்கு.
Feronia limonia	Vilamaram	விளாமரம்.
Ficus benghalensis	Ala maram	ஆலமரம்.
Ficus hispida	Chonathi	சோனத்தி.
Ficus glomerata	Athi	அத்தி.
Ficus religiosa	Arasamaram	அரசமரம்.
Flacourtia indica	Kattukala	காட்டுகனா.
Flacourtia jangomas	Mullumukanchi	முள்ளுமுகஞ்சி.
Flemingia species	....	முள்ளுமுகங்.
Garcinia cambogia	Kodukkapuli	கொடுக்கப்புளி.
Gardenia gummifera	Kambili	கம்பிளி.
Garuga pinnata	Aranelli	அறநெல்லி.
Gaultheria fragrantissima	Kolakkai	கொளக்காய்.
Givottia rottleriformis	Boothalai	பூதாளை.
Glochidion malabaricum	....	....
Gloriosa superba	Kalappaikizhangu	கலப்பைக்கிழங்கு.
Glycosmis pentaphylla	Kulapanai	கூளப்பனை.
Gmelina arborea	Kumil	குமிள்.
Gmelina asiatica	Vellakumil	வெள்ளகுமிள்.
Gnetum scandens	Yanaipendu	யானைப்பெண்டு.
Gordonia obtusa	....	....
Grewia asiatica	Palica	பாலிகா.
Grewia hirsuta	Thavidu	தவிடு.
Grewia glabra	Anaikattimaram	ஆனைகட்டிமரம்.
Grewia tiliaefolia	Thadasu	தடசு.
Gymnosporia montana	Kattangi	காட்டாங்கி.
Gyrocarpus jacquinii	Thanakku	தனக்கு.
Haeckeria subpeltata	....	....
Hardwickia binata	Achan	ஆச்சான்.
Helicteres isora	Valambiri	வலம்பிரி.
Hemidesmus indicus	Nannari	நான்னரி.
Hesperethusa crenulata	Kattu elimichai	காட்டு எலுமிச்சை.
Hippocratea indica	Odankodi	ஒடான்கொடி.
Hiptage benghalensis	Vennalankodi	வெண்ணலான்கொடி.
Holoptelea integrifolia	Ayamaram	ஆயமரம்.
Hopea parviflora	Vellakongu	வெள்ளகோங்கு.
Hydnocarpus laurifolia	Maravetti or Korangu-thalai.	மரவெட்டி அல்லது கொரங்குதலை.
Hydnocarpus alpina	Do.	௸
Ichnocarpus frutescens	Oothalkodi	ஊதல்கொடி.
Ilex denticulata	....	....

Botanical name. (1)	*Tamil name.* (2)	
Ipomœa species	Krishnakranthi	கிருஷ்ணகிராந்தி.
Ixora arborea	Sulundu	சுளுண்டு.
Jasminium species	Malligai	மல்லிகை.
Jatropha curcas	Kattamanakku	காட்டாமணக்கு.
Jatropha glandulifera	Adalai	அடலை.
Kigelia pinnata	Anaipudukkan	யானைபுடுக்கன்.
Kingiodendron pinnatum	Kolavu	கொளவு.
Knema attenuata	Jathikai	ஜாதிக்காய்.
Kydia calycina	Vendai	வெண்டை .
Lagerstroemia speciosa	Pumaruthu	பூமருது.
Lagerstroemia lanceolata	Venthekku	வெண்தேக்கு.
Lagerstroemia parviflora	Peikadukkai	பேய்கடுக்காய்.
Lannea coromandelica	Odiyamaram	ஒடியமரம்.
Lantana camara	Puchedi	பூச்சேடி.
Laportea crenulata	Anaichoriyan	யானைச்சொரியன்.
Lawsonia inermis	Maruthani	மருதாணி.
Leea indica	Nekku	நெக்கு.
Leucas aspera	Thumbai	தும்பை.
Litsea oleoides		
Litsea stocksii		
Lochnera pusilla		
Maba buxifolia	Kattuthovarai	காட்டுத்துவரை.
Machilus macrantha	Kolarmavu	கொளர்மாவு.
Macaranga peltata	Vattai	வட்டை.
Madhuca indica	Iluppai	இலுப்பை.
Mallotus philippensis	Kamala	கமலா.
Mangifera indica	Mamaram	மாமரம்.
Melia dubia	Malaivembu	மலைவேம்பு.
Meliosma arnottiana	Kusavi	குசவி.
Mesua ferrea	Suruli	சுருளி.
Miliusa tomentosa		
Mimosa pudica	Thottalsurungi	தொட்டால்சுருங்கி.
Mimusops elengi	Magil	மகிள்.
Mitragyna parvifolia	Neerkadambu	நீர்கடம்பு.
Morinda tinctoria	Nona	நோணா.
Moringa oleifera	Murungai	முருங்கை.
Mundulea sericea	Pullavaram	புல்லாவரம்.
Murraya paniculata	Kattukaruveppilai	காட்டுகருவேப்பிலை.
Musa species	Kalvazhai	கல்வாழை.
Mussaenda frondosa		....
Nerium indicum	Arali	அரளி.
Nothapodytes foetida	Arali	அரளி.
Ocimum kilimandscharicum	Karpurathulasi	கற்பூரதுளசி.
Olea dioica	Idalai	எடலை.
Opuntia dillenii	Sappathikalli	சப்பாத்திக்கள்ளி.
Oroxylum indicum	Palagapayini	பலகப்பயினி.
Palaquium ellipticum	Pali or Palvadinjan	பாலி அல்லது பால்வடிஞ்சான்.
Pandanus furcatus	Thazhai	தாழை.
Pandanus textorius	Do.	ஷ
Pavetta indica	Pavattai	பாவட்டை.
Pavonia zeylanica		
Periploca species	Mavali Kizhangu	மாவலிக்கிழங்கு.
Phoenix acaulis	Siru ichai	சிறு ஈச்சை.
Pinanga dicksonii	Kanakamuku	கானகமுகு.
Pithecolobium dulce	Konapuli	கோணபுளி.
Piper longum	Thippili	திப்பிலி.
Piper species	Milagu	மிளகு.
Plumeria rubra	Navilla arali	நாவில்லா அரளி.
Poeciloneuron indicum	Vayal	வயல்.
Polyalthia cerasoides	Nettulingam	நெட்டுலிங்கம்.
Polyalthia coffeoides	Nedunarai	நெடுநாரை.
Polyalthia fragrans	Do.	ஷ
Polyalthia longifolia	Nettulingam	நெட்டுலிங்கம்.
Pongamia pinnata	Pungam	புங்கம்.
Premna integrifolia	Minnai	மின்னை.
Premna tomentosa	Kolakkattai thekku	கொனக்கட்டை தேக்கு.
Prosopis julieflora	Seemaivalli	சீமைவன்னி.
Protium caudatum	Malankiluvai	மலங்கிளுவை.
Pterocarpus marsupium	Vengai	வேங்கை.

Botanical name. (1)	*Tamil name.* (2)	
Pterolobium indicum	Karuindu	கருஇண்டு.
Radermachera xylocarpa	Kalpathiri	கல்பாதிரி.
Randia dumetorum	Karai	காரை.
Rhododendron arboreum	Poomaram	பூமரம்.
Rhus mysorensis	..	..
Rouwolfia serpentina	Sarpagandi or Eyakundu.	சர்பகந்தி அல்லது ஈயகுண்டு.
Rubus lasiocarpus	Kolalindu	கோலாலிண்டு.
Salmalia insignis	Poolai	பூளை.
Salmalia malabarica	Do.	௸
Salvadora persica	Kunni	குன்னி.
Samanea saman	Thoongumoonjimaram	தூங்குமூஞ்சிமரம்.
Santalum album	Santhanam	சந்தனம்.
Sapindus emarginatus	Poochakottai	பூச்சகோட்டை.
Schleichera trijuga	Poovathi	பூவந்தி.
Schrebera swietenioides	Mahalingam	மகாலிங்கம்.
Scutia myrtina	Thoratti or Kokkimullu	தொரட்டி அல்லது கொள்கிமுள்ளு.
Securinega leucopyrus	Veppula	வெப்புலா.
Securinega virosa	Veppulathi	வெப்புலாத்தி.
Semecarpus anacardium	Shenkottai	செங்கொட்டை.
Smilax zeylanica	..	..
Solanum pubescens	Sundai	சுண்டை.
Solanum species	Kathiri	கத்திரி.
Solanum trilobatum	Sundakkai	சுண்டக்காய்.
Solanum verbascifolium	Mullikkai	முள்ளிக்காய்.
Solanum xanthocarpum	Kandankathiri	கண்டங்கத்திரி.
Spondias pinnata	Mampulichi	மாம்புளிச்சை.
Sterculia urens	Senthanakku	செந்தனக்கு.
Sterculia villosa	Yanaikattinar	யானைக்கட்டிநார் அல்லது வக்கநார்.
Stereospermum personatum	Poopadiri	பூபாதிரி.
Streblus asper	Kuttipila	குட்டிபலா.
Strobilanthes species	Kurinji	குறிஞ்சி.
Strychnos nuxvomica	Etti	எட்டி.
Strychnos potatorum	Thethankottai	தேத்தான்கொட்டை.
Swietenia macrophylla	Mahogany	மஹாகனி.
Swietenia mahoganii	Mahogany	மஹாகனி.
Symplocos laurina	Kambilivetti	கம்பிளிவெட்டி.
Syzygium cumini	Navalmaram	நாவல்மரம்.
Syzygium gardneri	Neernaval	நீர்நாவல்.
Tabernaemontana heyneana	Nandiyavattai	நந்திதாவட்டை.
Tamarindus indica	Puliyamaram	புளியமரம்.
Tectona grandis	Thekku	தேக்கு.
Tephrosia species	Kolinji	கொளிஞ்சி.
Tetrameles nudiflora	Cheeni	சீனி.
Thevetia peruviana	Thiruvachipoo	திருவாச்சிபூ.
Terminalia arjuna	Nirmathi	நீர்மத்தி.
Terminalia belerica	Thani	தானி.
Terminalia chebula	Kadukkai	கடுக்காய்.
Terminalia paniculata	Pillamaruthu	பில்லமருது.
Terminalia tomentosa	Karumaruthu	கருமருது.
Thespesia lampas	Kattuparuthi	காட்டுப்பருத்தி.
Thespesia populnea	Poovarasu	பூவரசு.
Toddalia asiatica	Kattumilagu	காட்டுமிளகு.
Trema orientalis	Ambaruthi	ஆம்பருத்தி.
Trichosanthes cucumerina	Peypodal	பேய்பொடல்.
Tridax procumbens	..	..
Vateria indica	Vellapayini	வெள்ளபயினி.
Vateria macrocarpa	Do.	௸
Ventilago madraspatana	Vembadam	வேம்பாடம்.
Vitex altissima	Mayiladi	மயிலடி.
Vitex negundo	Nochi	நொச்சி.
Viscum species	Ottu	ஓட்டு.
Walsura piscida	Valsura	வல்சூரா.
Webera corymbosa	Pavattai	பாவட்டை.
Wrightia tinctoria	Palai	பாலை.
Zingiber casumunar	Kattumanjal	காட்டு மஞ்சள்.
Zizyphus glabrata	Karikattan	கரிக்கட்டான்.
Zizyphus mauratiana	Elandai	எலந்தை.
Zizyphus oenoplia	Churimullu	சூரிமுள்ளு.
Zizyphus xylopyrus	Kottaielandai	கொட்டை எளந்தை.

APPENDIX X—LIST OF GRASSES COMMONLY FOUND IN THE BOLAMPATTI RANGE.

Botanical name. (1)	*Tamil name.* (2)	
Aristida depressa	Oosipullu	ஊசிபுல்லு.
Aristida hyotrix	Do.	
Bambusa arundinacea	Perumoongil	பெருமூங்கில்.
Bothriochloa pertusa	Chinnakaraipullu	சின்னகாரைப்புல்லு.
Brachiaria distachia	Murugulup	முறுகுளுப்புல்லு.
Brachiaria ramosa	Puliampullu	புளியம்புல்லு.
Brachiaria remota		
Chloris polystachya		
Chrysopogon fulvus	Solapullu	சோலப்புல்லு.
Cynodon dactylon	Arugumpullu	அறுகம்புல்லு.
Dactyloctenium ægyptium		
Dendrocalamus strictus	Kalmoongil	கல்மூங்கில்.
Digitaria sanguinalis	Arisipullu	அரிசிபுல்லு.
Digitaria marginata	Do.	ஷை
Enteropogon monostachyus	Malaipullu	மலைப்புல்லு.
Eragrostis bifaria	Seranaipullu	சேரனைப்புல்லு.
Eragrostis poæoides		
Eragrostis tenella		
Heteropogon contortus	Oosipullu	ஊசிப்புல்லு.
Ochlandra beddomei	Itakalli	இட்டக்கள்ளி.
Oropetium thomacum	Koravanthodupullu	கொரவன்தொடு.
Panicum trypheron		
Sehima nervosum	Kurai itti	கூரைஈட்டி.
Sporobolus minutiflorus		